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GOVERNMENT REPORTS ANNOUNCEMENTS

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GOVERNMENT REPORTS ANNOUNCEMENTS

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FIELD 1. AERONAUTICS. Includes the following Groups: Aerodynamics; Aeronautics; Aircraft; Aircraft Flight Control and Instrumentation; Air Facilities.

FIELD 2. AGRICULTURE. Includes the following Groups: Agricultural Chemistry; Agricultural Economics; Agricultural Engineering; Agronomy and Horticulture; Animal Husbandry; Forestry.

FIELD 3. ASTRONOMY AND ASTROPHYSICS. Includes the following Groups: Astronomy; Astrophysics; Celestial Mechanics.

FIELD 4. ATMOSPHERIC SCIENCES. Includes the following Groups: Atmospheric Physics; Meteorology.

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FIELD 6. BIOLOGICAL AND MEDICAL SCIENCES. Includes the following Groups: Biochemistry; Bioengineering; Biology; Bionics; Clinical Medicine; Environmental Biology; Escape, Rescue, and Survival; Food, Hygiene and Sanitation; Industrial (Occupational) Medicine; Life Support; Medical and Hospital Equipment; Microbiology; Personnel Selection and Maintenance (Medical); Pharmacology; Physiology; Protective Equipment; Radiobiology; Stress Physiology; Toxicology; Weapon Effects.

FIELD 7. CHEMISTRY. Includes the following Groups: Chemical Engineering; Inorganic Chemistry; Organic Chemistry; Physical Chemistry, Radio and Radiation Chemistry.

FIELD 8. EARTH SCIENCES AND OCEANOGRAPHY. Includes the following Groups: Biological Oceanography; Cartography; Dynamic Oceanography; Geochemistry; Geodesy; Geography; Geology and Mineralogy; Hydrology and Limnology; Mining Engineering; Physical Oceanography; Seismology; Snow, Ice, and Permafrost; Soil Mechanics; Terrestrial Magnetism.

FIELD 9. ELECTRONICS AND ELECTRICAL ENGINEERING. Includes the following Groups: Components; Computers; Electronic and Electrical Engineering; Information Theory; Subsystems; and Telemetry.

FIELD 10. ENERGY CONVERSION (Non-propulsive). Includes the following Groups: Conversion Techniques; Power Sources; Energy Storage.

FIELD 11. MATERIALS. Includes the following Groups: Adhesives and Seals; Ceramics, Refractories, and Glasses; Coatings, Colorants, and Finishes; Composite Materials; Fibers and Textiles; Metallurgy and Metallography; Miscellaneous Materials; Oils, Lubricants, and Hydraulic Fluids; Plastics; Rubbers; Solvents, Cleaners, and Abrasives; Wood and Paper Products.

FIELD 12. MATHEMATICAL SCIENCES. Includes the following Groups: Mathematics and Statistics; Operations Research.

FIELD 13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING. Includes the following Groups: Air Conditioning, Heating, Lighting, and Ventilating; Civil Engineering; Construction Equipment, Materials, and Supplies; Containers and Packaging; Couplings, Fittings, Fasteners, and Joints; Ground Transportation Equipment; Hydraulic and Pneumatic Equipment; Industrial Processes; Machinery and Tools; Marine Engineering; Pumps, Filters, Pipes, Fittings, Tubing, and Valves; Safety Engineering; Structural Engineering.

FIELD 14. METHODS AND EQUIPMENT. Includes the following Groups: Cost Effectiveness; Laboratories, Test Facilities, and Test Equipment; Recording Devices; Reliability; Reprography.

FIELD 15. MILITARY SCIENCES. Includes the following Groups: Antisubmarine Warfare; Chemical, Biological, and Radiological Warfare; Defense; Intelligence; Logistics; Nuclear Warfare; Operations, Strategy, and Tactics.

FIELD 16. MISSILE TECHNOLOGY. Includes the following Groups: Missile Launching and Ground Support; Missile Trajectories; Missile Warheads and Fuses; Missiles.

FIELD 17. NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES. Includes the following Groups: Acoustic Detection; Communications; Direction Finding; Electromagnetic and Acoustic Countermeasures; Infrared and Ultraviolet Detection; Magnetic Detection; Navigation and Guidance; Optical Detection; Radar Detection; Seismic Detection.

FIELD 18. NUCLEAR SCIENCE AND TECHNOLOGY. Includes the following Groups: Fusion Devices (Thermonuclear); Isotopes; Nuclear Explosions; Nuclear Instrumentation; Nuclear Power Plants; Radiation Shielding and Protection; Radioactive Wastes and Fission Products; Radioactivity; Reactor Engineering and Operation; Reactor Materials; Reactor Physics; Reactors (Power); Reactors (Non-power); SNAP Technology.

FIELD 19. ORDNANCE. Includes the following Groups: Ammunition, Explosives, and Pyrotechnics; Bombs; Combat Vehicles; Explosions, Ballistics, and Armor; Fire Control and Bombing Systems; Guns; Rockets; Underwater Ordnance.

FIELD 20. PHYSICS. Includes the following Groups: Acoustics; Crystallography; Electricity and Magnetism; Fluid Mechanics; Masers and Lasers; Optics; Particle Accelerators; Particle Physics; Plasma Physics; Quantum Theory, Solid Mechanics; Solid-state Physics; Thermodynamics; Wave Propagation.

FIELD 21. PROPULSION AND FUELS. Includes the following Groups: Air-breathing Engines; Combustion and Ignition; Electric Propulsion; Fuels; Jet and Gas Turbine Engines; Nuclear Propulsion; Reciprocating Engines; Rocket Motors and Engines; Rocket Propellants.

FIELD 22. SPACE TECHNOLOGY. Includes the following Groups: Astronautics; Spacecraft; Spacecraft Trajectories and Reentry; Spacecraft Launch Vehicles and Ground Support.

REPORTS & TRANSLATIONS

1. AERONAUTICS

1A. Aerodynamics

AD-775 039/1GA Not available NTIS
Illinois Inst of Tech Chicago Dept of Mechanics Mechanical and Aerospace Engineering
ON AEROACOUSTIC COUPLING IN FREE-STREAM TURBULENCE MANIPULATORS,
J. L. Way, H. M. Nagib, and J. Tan-atichat. Oct 73, 14p AFOSR-TR-74-0225
Contract F44620-69-C-0022
Pub. in Proceedings of AIAA Aero-Acoustics Conference, Seattle, Wash., 15-17 Oct 73, p1-9 1973.
Availability: Paper copy available from AIAA, 1290 Avenue of the Americas, New York, N.Y. 10019. PC$2.00/MF$1.00 as AIAA Paper No. 73-1015.

Descriptors: *Ducts, *Aerodynamics, Acoustics, Turbulence, Coupling(Interaction), Suppression, Wind tunnels.
Identifiers: *Turbulence manipulators, *Aeroacoustics.

Wakes of inserts, such as honeycombs, perforated plates and screens, in duct flows often couple non-linearly with acoustic fields leading to objectionable sound levels and modification of the free-stream turbulence. It is experimentally demonstrated how the key mechanism, the shear-layer instabilities in the wakes of these turbulence manipulators, can be driven by artificial sound and how it can be spontaneously organized and intensified in the presence of local acoustic resonances. Tuning of the acoustic excitation can suppress or enhance the downstream turbulence. (Author)

AD-775 066/4GA PC$4.00/MF$1.45
Advisory Group for Aerospace Research and Development Paris (France)
COMMENTS ON NASA LANGLEY RESEARCH ON TRANSONIC UNSTEADY AERODYNAMICS,
Samuel R. Bland. Dec 73, 14p Rept no. AGARD-611
Presented at the AGARD Structures and Materials Panel Meeting (36th) Held in Milan (Italy) 4 Apr 73. NATO furnished.

Descriptors: *Transonic flow, *Flutter, Nonlinear systems, Mach number, Aircraft, Stability.
Identifiers: *Unsteady flow.

Research is reported in an effort to fill the need for accurate unsteady transonic aerodynamics for use in flutter calculation. The paper describes five different approaches to the transonic unsteady flow problem. These methods each attempt to take into account the nonconstant Mach number characteristic of transonic flow, some more accurately than others. Viscous effects are not included.

AD-775 072/2GA PC$3.25/MF$1.45
Rand Corp Santa Monica Calif
THE FLOW OVER A POROUS BODY: A SINGULAR PERTURBATION PROBLEM WITH TWO PARAMETERS,
K. Gersten, and J. F. Gross. May 73, 46p Rept no. R-980-PR

Descriptors: *Airframes, *Aerodynamics, *Porous materials, Two dimensional flow, Flow fields, Navier Stokes equations, Boundary layer, Stagnation point, Cooling.

The proper design of high-speed aircraft depends to a large extent on the ability to predict the skin-friction and heat-transfer characteristics resulting from the interaction of the surface of the aircraft with the surrounding medium. At high speeds, viscous heating in the laminar boundary layer on the surface of the vehicle can cause elevated temperatures that result in loss of structural integrity or ablation of the surface. To alleviate this problem, a coolant can be injected through pores in the surface. Surface heating is reduced both by the action of the coolant and by the diminished heat transfer resulting from an increase in boundary-layer thickness. The report discusses the effects of injection or suction of material near the stagnation point of a porous body--the extreme forward point where the oncoming air is brought to rest and the boundary layer essentially begins. Emphasis is given to strong injection and suction problems.

AD-775 098/7GA PC$3.25/MF$1.45
Virginia Polytechnic Inst and State Univ Blacksburg Dept of Aerospace Engineering
HYPERSONIC VISCOUS-INVISCID INTERACTION WITH VECTORED SURFACE MASS TRANSFER,
G. R. Inger, and T. F. Swean. 1974, 26p AFOSR-TR-74-0193
Grant AF-AFOSR-2173-72

Descriptors: *Thrust vector control systems, *Injection, Hypersonic flow, Mass transfer, Heat transfer, Pressure gradients, Laminar boundary layer, Suction slots.

A fundamental theoretical study of hon ogeneous vectored injection and suction in high sp ed flows with heat transfer and self-induced pressure gradients is described, based on local similarity solutions of the laminar boundary layer equations. The results show the important effects of both injection velocity and vector angle on a variety of physical properties of practical interest such as velocity and temperature profiles, skin friction, heat transfer rate, displacement thickness and induced pressure field. In addition, the exis ence of a new set of solutions pertaining to upstream-vectored injection is established and investigated. Moreoever, it is shown that the frictional heating associated with the tangential injection velocity component can significantly influence the heat transfer characteristics of high speed flows. (Author)

AD-775 108/4GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
ON THE SOLUTION TO THE PROBLEM OF THE FLOW AROUND A V-SHAPED WING WITH AN INTENSE SHOCK WAVE ON THE LEADING EDGE,
V. I. Lapygin. 1 Feb 74, 14p Rept no. FTD-HT-23-555-74
Edited trans. of Akademiya Nauk SSSR. Izvestiya. Mekhanika Zhidkosti i Gaza, n3 p114-119 May/Jun 73, by Marilyn Olaechea.

Descriptors: *Swept wings, *Supersonic characteristics, *Flow fields, Numerical analysis, Leading edges, Wedges, Shock waves, Angle of attack, Translations, USSR.
Identifiers: V shaped wings.

A report is made on the effect of initial and boundary conditions on the numerical solution to the problem of the flow around a V-shaped wing with supersonic leading edges.

AD-775 110/0GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
SHAPE OF A SUPERSONIC AIRPLANE,
Kazimierz Gilewski. 29 Jan 74, 15p Rept no. FTD-HC-23-803-74
Edited trans. of Technika Lotnicza i Astronautyczna (Poland) v26 p7-10 Sep 71.

Descriptors: *Supersonic aircraft, Supersonic flight, Supersonic characteristics, Aerodynamics, Supersonic flow, Translations, Poland.

AD-775 189/4GA Not available NTIS
Aeronautical Research Associates of Princeton Inc N J
A METHOD OF CALCULATING AIRCRAFT WAKE VELOCITY PROFILES AND COMPARISON WITH FULL-SCALE EXPERIMENTAL MEASUREMENTS,
Coleman duP. Donaldson, Richard S. Snedeker, and Roger D. Sullivan. Feb 74, 14p AFOSR-TR-74-0186
Contract F44620-69-C-0089
Pub. in the Proceedings of AIAA Aerospace Sciences Meeting (12th), Washington, D. C. 30 Jan-1 Feb 74.
Availability: Paper copy available from AIAA-1290 Avenue of the Americas, New York, N.Y. 10019. PC$2.00/MF$1.00. (AIAA Paper-74-39).

Descriptors: *Transport aircraft, *Wake, *Vortices, Jet transport planes, Velocity, Inviscid flow, Correlation techniques, Lift.
Identifiers: DC-7 aircraft, DC-9 aircraft, C-141 aircraft.

A method is developed for the calculation of the initial inviscid form of rolled-up wake vortices behind a wing having arbitrary lift distribution. The method makes use of the Betz assumptions of conservation of wake vorticity and moments of vorticity. It is found that a simple relationship exists between the radial distribution of vorticity in the rolled-up wake and the spanwise lift distribution. Computed tangential velocity profiles for DC-7, DC-9, and C-141 aircraft are shown to compare favorably with profiles measured by the FAA during tower flyby tests of these aircraft in both flapped and unflapped configurations. (Author)

AD-775 209/0GA PC$6.50/MF$1.45
Advisory Group for Aerospace Research and Development Paris (France)
AERODYNAMIC INTERFERENCE INDUCED BY REACTION CONTROLS.
AGARDograph rept.,
F. W. Spaid, and L. A. Cassel. Dec 73, 66p Rept no. AGARD-AG-173

Descriptors: *Reaction control systems, *Aerodynamic forces, Flow fields, Flow visualization, Boundary layer transition, Distribution, Static pressure, Flat plate models.

The literature pertaining to the interaction of a sonic or supersonic gaseous jet with a transverse external flow has been reviewed. The flowfields associated with these interactions are complex, and knowledge of them is based largely on results of experiments. Numerous examples of data from flat-plate experiments are presented. These include static pressure distribution, induced forces, flowfield survey, and flow visualization results. Analyses and correlation techniques for jet interaction flows are discussed. The region upstream of a jet in two-dimensional flow is similar to the flow upstream of a forward-facing step, and the flow associated with a jet from a circular nozzle in a flat plate resembles the flow past a blunt-nosed slender body. The single most important variable in determining the scale of these interactions is the ratio of jet momentum flux to the external-flow dynamic pressure.

AD-775 210/8GA PC$4.50/MF$1.45
Advisory Group for Aerospace Research and Development Paris (France)
ON THE PREDICTION OF AERODYNAMIC LOADS ON OSCILLATING WINGS IN TRANSONIC FLOW,
H. Tijdeman, and R. J. Zwaan. Jan 74, 30p Rept no. AGARD-612
Presented at the AGARD Structures and Materials Panel Meeting (36th) Milan 4 Apr 73. Supplement to the Manual on Aeroelasticity. Volume 2, Chapter 10. NATO furnished.

Descriptors: *Swept wings, *Transonic characteristics, *Aerodynamic loading, *Oscillation, Mathematical prediction, Flutter, Computer programming, Supercritical airfoils, Linearity, Wind tunnel tests, Wind tunnel models, Pressure, Statistical distributions, Shock waves.
Identifiers: Unsteady flow.

For a long time, flutter specialists were not concerned with unsteady aerodynamic forces in transonic flow. However, because it was proved that rapid variations of unsteady aerodynamic forces occurred during operation in the transonic speed range, especially with regard to damping, and sometimes reached such a degree that they brought about catastrophic flutter, considerable effort was undertaken to improve knowledge in this critical area. Possibilities to develop calculation methods for oscillating wings in transonic flow are discussed. Special attention is given to the question of linearisation. Shock motion and shock strength are investigated.

AD-775 284/3GA PC$3.00/MF$1.45
Naval Ship Research and Development Center Bethesda Md Aviation and Surface Effects Dept
CIRCULATION CONTROL - A BIBLIOGRAPHY OF NSRDC RESEARCH AND SELECTED OUTSIDE REFERENCES,
Michael B. Stone, and Robert J. Englar. Jan 74, 18p Rept nos. Aero-1191, NSRDC-4108

Descriptors: *Helicopters, *Circulation control airfoils, *Bibliographies, Boundary layer control, Aerodynamic forces, Helicopter rotors, Airfoils, Aerodynamic control surfaces, Wind tunnel tests.

The report presents a bibliography of technical notes, formal reports, and technical papers by personnel of the Rotary Wing Division of the Aviation and Surface Effects Department, Naval Ship Research and Development Center (NSRDC) from the beginning of calendar year 1969 until the end of fiscal year 1973. The citations are arranged chronologically and represent the technology of circulation control as it has developed at NSRDC. The report also contains appendixes of selected outside references which are pertinent to circulation control. (Author)

AD-775 310/6GA Reprint
Michigan Univ Ann Arbor Dept of Aerospace Engineering
MEASUREMENT OF THE STRUCTURE OF THE REYNOLDS STRESS IN A TURBULENT BOUNDARY LAYER,
S. S. Lu, and W. W. Willmarth. 22 Jan 73, 34p
Contract N00014-67-A-0181-0015
Availability: Pub. in Jnl. of Fluid Mechanics, v60 pt3 p481-511 1973.

Descriptors: *Turbulent boundary layer, Stresses, Reynolds number, Boundary layer, Wind tunnels, Hot wire, Probes, Spatial distribution.
Identifiers: Reynolds stress.

The report supplements previous work in which the velocity at the edge of the sublayer is used as a detector signal for bursts and sweeps. The signal uv from and X-wire proble is sampled at various locations in the boundary layer to obtain characteristic contributions to Reynolds stress during bursts and sweeps. The sampled values of uv are sorted into quadrants of the uv plane and it is found that throughout the boundary layer the bursts contribute 77% of uv, the sweeps contribute 55% of uv, and remaining contribute -32% to uv at any distance from the wall. The scaling of the mean time interval between bursts with outer flow variables is confirmed. It is suggested that many of the features of the fluctuating flow revealed by the measurements may be explained by convection past the probe of an evolving deterministic flow pattern such as the hairpin vortex model proposed by Willmarth and Tu in 1966. (Author)

AD-775 320/5GA Reprint
Cornell Univ Ithaca N Y
VARIATIONAL APPROACH TO THE LIFTING SURFACE PROBLEM,
S. F. Shen, and Stevens T. K. Chan. 11 Jun 73, 7p
Contract N00014-67-A-0077-0024
Presented at the AIAA Aerospace Sciences Meeting (11th), Washington, D.C., 10-12 Jan 73 (Paper No. 73-87). Revision of report dated 20 Feb 73.
Availability: Pub. in AIAA Jnl., v11 n10 p1390-1395 Oct 73.

Descriptors: *Aircraft, *Aerodynamics, Airfoils, Three dimensional flow, Leading edges, Lifting surfaces, Boundary value problems, Fluid mechanics.
Identifiers: Finite element analysis.

Application of a variational principle to the non-self-adjoint lifting surface integral equation, first proposed by Flax, is given a closer look from the finite-element viewpoint. A scheme to avoid the usual introduction of the reverse flow is proposed. The plan form is divided into elements, and the unknown pressure loading is expressed as the sum of shape functions, each of which gives a local approximation within an element but vanishes elsewhere. The quadrature difficulty in the numerical solution can thus be effectively reduced. Because of the difference kernel in the integral equation, if both the plan form and the finite-element mesh pattern obey polar symmetry, the resulting algebraic problem is shown to have a symmetric coefficient matrix, in fact identical to that which follows from a straight Galerkin procedure using the same basis of approximating functions. For arbitrary plan form and mesh pattern, symmetrization can be achieved by an imbedding technique. Numerical examples are worked out for the classical two-dimensional flat plate and a number of lifting surfaces in steady incompressible flow, mainly to demonstrate the feasibility of the approach. (Author)

AD-775 336/1GA PC$4.00/MF$1.45
West Virginia Univ Morgantown Dept of Aerospace Engineering
LIFTING SURFACE ANALYSIS USING CHORDWISE LOAD SEGMENTS,
Subrato Chandra, and John L. Loth. Aug 73, 77p Rept no. TR-37
Contract N00014-68-A-0512

Descriptors: *Lifting surfaces, Subsonic flow, Leading edges, Trailing edge, Mathematical models, Computer programs.
Identifiers: Kernel functions.

Of the two techniques of subsonic lifting surface theory the kernel function approach is superior to the lattice discretization procedure for solving simple planar problems. But complex problems can be more effectively solved by the lattice procedure using modern computers. However, the results of lattice calculations are not entirely satisfactory and it is desirable to have a simpler kernel procedure capable of solving difficult problems. The present analysis attempts to establish a flexible kernel function procedure which is faster than the existing kernel function techniques and more accurate than the lattice methods. This is done by introducing a new chordwise function to be used in the kernel function procedure. The present function is comprised of linearly loaded chordwise segments with appropriate non linear loading segments for the leading and trailing edge. (Modified author abstract)

AD-775 385/8GA PC$4.50/MF$1.45
Lockheed-Georgia Co Marietta
VALIDATION OF NEW GUST DESIGN PROCEDURES FOR MILITARY TRANSPORTS.
Final rept. 1 Mar-9 Nov 73,
James K. Spitler. Nov 73, 115p Rept no. LG73ER0153 AFFDL-TR-73-118
Contract F33615-73-C-3047

Descriptors: *Jet transport planes, *Gust loads, Cargo aircraft, Aerodynamic loading, Bending moments, Dynamic response, Mission profiles, Turbulence, Power spectra.
Identifiers: C-130 aircraft, C-141 aircraft, C-141A aircraft, C-140 aircraft, C-5 aircraft, C-5A aircraft, Design criteria.

AFFDL-TR-70-106, 'Design Manual for Vertical Gust Based on Power Spectral Techniques,' outlines four procedures for design of aircraft for vertical gusts. Validation of these new gust design procedures for military aircraft is provided by application of these procedures to four military transports. Lockheed models C-130, C-141A, C-140, C-130, and C-5A provide the means to evaluate design gust response for a range of gross weights from 20,000 to 750,000 pounds and encompass design features such as straight and swept wings, prop jets, fan jets, and turbo jets. The four design procedures, each successively more detailed, are applied for each aircraft evaluation even though they may not be required. In practice, the design manual allows analysis conclusion upon successful completion of the less detailed procedures. (Modified author abstract)

AD-775 538/2GA PC$6.75/MF$1.45
Mcdonnell Douglas Corp Long Beach Calif
ANALYTICAL STUDIES OF TWO-ELEMENT AIRFOIL SYSTEMS.
Interim rept. Feb 71-Dec 73,
Richard M. James. Feb 74, 276p Rept no. MDC-J5831
Contract N00014-72-C-0218

Descriptors: *Airfoils, *Aerodynamic slots, Hydrodynamics, Mapping(Transformations), Complex variables, Analytic functions, Special functions(Mathematical).

The report represents an interim stage of a research program sponsored by ONR to try and put the basic mathematics of design and flow analysis methods for two-element airfoil systems on an equivalent footing to that of single element configurations with the ultimate end in view of producing 'optimum' designs. Techniques of conformal mapping and multiple image reflection are used to solve problems connected with two disjoint circles and then to develop the integral equations describing problems of real interest posed in a canonical domain -- the annular space between two concentric circles. Using this point of view, the essential character of a promising general technique is deduced. (Modified author abstract)

AD-775 555/6GA Not available NTIS
Cornell Univ Ithaca N Y
THE DESIGN OR OPERATION OF AIRCRAFT TO MINIMIZE THEIR SONIC BOOM,
A. R. Seebass. 1973, 10p
Presented at AIAA Aircraft Design, Flight Test and Operations Meeting (5th) St. Louis, Mo., 6-8 Aug 73. Paper no. 73-817.
Availability: Paper copy available from AIAA, 1290 Avenue of the Americas, New York, N.Y. 10019.

Descriptors: *Supersonic aircraft, *Sonic boom, *Noise reduction, Shock waves, Aerodynamic configurations, Supersonic flight, Overpressure.
Identifiers: *Design criteria.

Means of reducing or eliminating the sonic boom through aerodynamic design or aircraft operation are discussed. These include designing aircraft to minimize or eliminate certain features of the overpressure signature, operating aircraft at slightly supersonic speeds so that the sonic boom does not reach the ground, and seeking reductions through the high altitude-high speed flight conditions of hypersonic transports. A simple computer program has been developed that determines the area development of the equivalent body of revolutionn required to minimize various sonic boom signature parameters. (Author)

N74-14702/6GA PC$5.25
National Aeronautics and Space Administration, Washington, D.C.
AERONAUTICAL ENGINEERNG: A SPECIAL BIBLIOGRAPHY WITH INDEXES, SUPPLEMENT 36.
Oct 73, 184p NASA-SP-7037(36)

Descriptors: *Aerodynamics, *Aeronautical engineering, *Bibliographies, Aeronautics, Aircraft design, Aircraft engines, Ground support equipment.

For abstract, see STAR 1206

N74-14708/3GA PC$4.75/MF$1.45
National Research Council of Canada, Ottawa (Ontario).
AN EXPERIMENTAL ANALYSIS AND BUFFET INVESTIGATION OF THE SHOCKLESS LIFTING AIRFOIL NO. 1.
J. J. Kacprzynski. Aug 73, 52p NRC-13673, LR-569

Descriptors: *Aerodynamic characteristics, *Airfoils, *Buffeting, *Drag measurement, *Wind tunnel tests, Aerodynamic coefficients, Data acquisition, Data processing, Pressure distribution, Wind tunnel apparatus.

For abstract, see STAR 1206

N74-14739/8GA PC$3.75/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
PLOTTING PROGRAM FOR AERODYNAMIC LIFTING SURFACE THEORY.
R. T. Medan, and K. S. Ray. Nov 73, 31p NASA-TM-X-62321

Descriptors: *Computer graphics, *Computer programs, *User manuals (Computer programs), *Wing planforms, Aerodynamic characteristics, Data processing equipment, Fortran, Numerical analysis, Subsonic flow.

For abstract, see STAR 1206

N74-14740/6GA PC$6.00/MF$1.45
Aeronautical Research Inst. of Sweden, Stockholm.
A QUICK LOOK AT THE STATE-OF-THE-ART IN FLIGHT TESTING OF CERTAIN AERODYNAMIC PARAMETERS RELATED TO WIND TUNNEL TESTING.
Final Report.
A. Bertelrud. 1973, 78p FFA-AU-966

Descriptors: *Aerodynamic characteristics, *Data acquisition, *Data correlation, *Flight tests, *Wind tunnel tests, Aircraft performance, Data processing, Wind tunnel apparatus.

For abstract, see STAR 1206

N74-14741/4GA PC$3.75/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
A STUDY OF THE NONLINEAR AERODYNAMICS OF BODIES IN NONPLANAR MOTION.
Ph.D. Thesis - Stanford Univ., Calif.
L. B. Schiff. Jan 74, 94p NASA-TR-R-421, A-5057

Descriptors: *Aerodynamic forces, *Angle of attack, *Flow distribution, *Nonuniform flow, *Supersonic flow, Aerodynamic coefficients, Applications of mathematics, Numerical analysis.

For abstract, see STAR 1206

N74-14744/8GA PC$3.00/MF$1.45
National Aerospace Lab., Tokyo (Japan).
MEASUREMENTS OF ROLLING MOMENTS ACTING ON THE STABILIZER OF T-TAILS OSCILLATING IN YAW.
T. Ichikawa, K. Isogai, Y. Ando, and H. Ejiri. 1973, 10p NAL-TR-324
In Japanese; English Summary.

Descriptors: *Horizontal tail surfaces, *Rolling moments, *T tail surfaces, *Wind tunnel tests, *Wing planforms, Aerodynamic coefficients, Data acquisition, Lateral stability, Stability derivatives.

For abstract, see STAR 1206

N74-14745/5GA PC$4.25/MF$1.45
Calspan Corp., Buffalo, N.Y.
ANALYSIS OF THE FLOW ABOUT DELTA WINGS WITH LEADING EDGE SEPARATION AT SUPERSONIC SPEEDS.
J. P. Nenni, and C. Tung. 1973, 43p NASA-CR-132358
Contract NAS1-11577

Descriptors: *Delta wings, *Flow distribution, *Separated flow, *Sharp leading edges, *Supersonic flow, Slender wings, Turbulent wakes, Two dimensional flow, Vortices.

For abstract, see STAR 1206

N74-14748/9GA PC$3.25/MF$1.45
National Aeronautical Lab., Bangalore (India).
AERODYNAMIC ASPECTS OF THE PROBLEMS OF AIR-INTAKES AND EXHAUST FOR A SUPERSONIC TRANSPORT AIRCRAFT.
J. Leynaert. Nov 73, 21p NAL-TR-194, NEAR-TP-124
Tran-Transl. Into English of "Aspects Aerodynamiques des Problemes de Prises d'Air et de Sorties de Reacteurs pour UN Avion de Transport Supersoniques", French Report Onera-TP-124. Conf-Presented at Assoc. For Maritime and Aeronaut. Tech., Paris, 11-15 May 1964.

Descriptors: *Aerodynamic configurations, *Afterbodies, *Concorde aircraft, *Engine inlets, *Jet engines, Aerodynamic characteristics, Air flow, Exhaust nozzles, Nozzle flow.

For abstract, see STAR 1206

N74-14755/4GA PC$5.75/MF$1.45
Washington Univ., St. Louis, Mo. School of Engineering and Applied Science.
CONCEPTS FOR A THEORETICAL AND EXPERIMENTAL STUDY OF LIFTING ROTOR RANDOM LOADS AND VIBRATIONS, PHASE 1.
K. H. Hohenemser, and G. H. Gaonkar. Sep 67, 74p NASA-CR-114707
Contract NAS2-4151

Descriptors: *Aerodynamic configurations, *Lifting rotors, *Rotor aerodynamics, *Rotor blades, Aerodynamic characteristics, Aerodynamic forces, Flapping, Performance prediction.

For abstract, see STAR 1206

N74-14756/2GA PC$5.00/MF$1.45
Washington Univ., St. Louis, Mo. School of Engineering and Applied Science.
CONCEPTS FOR A THEORETICAL AND EXPERIMENTAL STUDY OF LIFTING ROTOR RANDOM LOADS AND VIBRATIONS, PHASE 2.
K. H. Hohenemser, and G. H. Gaonkar. Aug 68, 56p NASA-CR-114708
Contract NAS2-4151

Descriptors: *Aerodynamic characteristics, *Aerodynamic forces, *Flapping, *Oscillating flow, *Rotary wings, *Rotor aerodynamics, Aerodynamic coefficients, Aerodynamic configurations, Numerical analysis, Rotor blades.

For abstract, see STAR 1206

N74-14757/0GA PC$6.75/MF$1.45
Washington Univ., St. Louis, Mo. School of Engineering and Applied Science.
CONCEPTS FOR A THEORETICAL AND EXPERIMENTAL STUDY OF LIFTING ROTOR RANDOM LOADS AND VIBRATIONS (THE EFFECTS OF SOME ROTOR FEEDBACK SYSTEMS ON ROTOR-BODY DYNAMICS), PHASE 7-A.
K. H. Hohenemser, and S. K. Yin. Jun 73, 92p NASA-CR-114709
Contract NAS2-4151

Descriptors: *Aerodynamic characteristics, *Aerodynamic forces, *Rotary wings, *Rotor aerodynamics, *Tilting rotors, Aerodynamic configurations, Flight tests, Performance tests, Rotor blades.

For abstract, see STAR 1206

N74-14758/8GA PC$4.00/MF$1.45
Washington Univ., St. Louis, Mo. School of Engineering and Applied Science.
CONCEPTS FOR A THEORETICAL AND EXPERIMENTAL STUDY OF LIFTING ROTOR RANDOM LOADS AND VIBRATIONS (IDENTIFICATION OF LIFTING ROTOR SYSTEM PARAMETERS FROM TRANSIENT RESPONSE DATA), PHASE 7-B.
K. H. Hohenemser, and D. A. Prelewicz. Jun 73, 39p NASA-CR-114710
Contract NAS2-4151

Descriptors: *Aerodynamic configurations, *Lifting rotors, *Rotor aerodynamics, *Rotor blades, Aerodynamic characteristics, Aerodynamic forces, Data acquisition, Flapping.

For abstract, see STAR 1206

N74-14759/6GA PC$6.00/MF$1.45
Washington Univ., St. Louis, Mo. School of Engineering and Applied Science.
CONCEPTS FOR A THEORETICAL AND EXPERIMENTAL STUDY OF LIFTING ROTOR RANDOM LOADS AND VIBRATIONS (FURTHER EXPERIMENTS WITH PROGRESSING/REGRESSING ROTOR FLAPPING MODES), PHASE 7-C.
K. H. Hohenemser, and S. T. Crews. Jun 73, 76p NASA-CR-114711
Contract NAS2-4151

Descriptors: *Aerodynamic configurations, *Lifting rotors, *Rotor aerodynamics, *Rotor blades, Aerodynamic forces, Data acquisition, Flapping, Numerical analysis.

For abstract, see STAR 1206

N74-14761/2GA PC$3.75/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EFFECT OF CONFIGURATION VARIATION ON EXTERNALLY BLOWN FLAP NOISE.
R. G. Dorsch, J. H. Goodykoontz, and N. B. Sargent. 1974, 33p NASA-TM-X-71495, E-7858
Conf-Presented at 12TH Aerospace Sci. Meeting, Washington, D. C., 30 Jan. - 1 Feb. 1974; Sponsored by Aiaa.

Descriptors: *Acoustic properties, *Aerodynamic configurations, *Aerodynamic noise, *Cold flow tests, *Externally blown flaps, Acoustic measurements, Exhaust nozzles, Flow geometry, Nozzle flow.

For abstract, see STAR 1206

N74-14766/1GA PC$4.25/MF$1.45
Royal Aircraft Establishment, Farnborough (England). Aerodynamics Dept.
CALCULATION OF THE INDUCED VELOCITY FIELD ON AND OFF THE WING PLANE FOR A SWEPT WING WITH GIVEN LOAD DISTRIBUTION.
C. C. L. Sells. 1973, 41p ARC-R/M-3725, RAE-TR-69231
Misc-Supersedes Rae-TR-69231; Rae-TR-70146; Arc-32144; Arc-32549.

Descriptors: *Load distribution (Forces), *Swept wings, *Velocity distribution, *Wing loading, Computer programming, Delta wings, Downwash, Integral transformations, Lifting bodies, Rectangular wings, Wing planforms, Wing roots, Wing span.

For abstract, see STAR 1206

N74-14767/9GA PC$3.75/MF$1.45
Royal Aircraft Establishment, Farnborough (England). Structures Dept.
SIMILARITY REQUIREMENTS FOR AEROELASTIC MODELS OF HELICOPTER ROTORS.
G. K. Hunt. 1973, 35p ARC-CP-1245, RAE-TR-72005
Misc-Supersedes Rae-TR-72005, Arc-33730.

Descriptors: *Aeroelasticity, *Helicopter design, *Rotary wings, *Structural design criteria, Dynamic models, Dynamic response, Flight simulation, Froude number, Mach number, Reynolds number, Scale models.

For abstract, see STAR 1206

N74-14960/8GA PC$3.25/MF$1.45
National Aeronautical Lab., Bangalore (India).
WIND TUNNEL DYNAMIC MODELS FOR AERO ELASTIC STUDIES IN TRANSONIC FLOW.
R. Destuynder, and R. Labourdettee. 1972, 25p NAL-TR-148
Tran-Transl. Into English from Rech. Aerosp. (Paris), No. 2, Mar. - Apr. 1972 p 107-112.

Descriptors: *Aeroelasticity, *Transonic flow, *Wind tunnel stability tests, Dynamic stability, Flight stability tests, Structural design.

For abstract, see STAR 1206

N74-14961/8GA PC$3.00/MF$1.45
National Aeronautical Lab., Bangalore (India). Propulsion Div.
A NOTE ON THE KINETIC HEATING TEST FACILITIES AT THE INSTITUTE OF AIRCRAFT STRUCTURES IN PORZ-WAHN.
H. Katsal. Sep 73, 10p NAL-TR-184
Tran-Transl. Into English of the Publ. "Anlage Zur Kinetischen Aufheizung des Instituts fuer Flugzeugbau, Abt. Thermoelastik in Porz-Wahn" Porz-Wahn, West Germany, Jun. 1973.

Descriptors: *Kinetic heating, *Test facilities, *Thermoelasticity, Aircraft structures, Flow distribution, Heat transmission, Infrared radiation.

For abstract, see STAR 1206

PAT-APPL-386 584 PC$3.00/MF$1.45
Department of the Air Force Washington D C
VARIABLE ANGLE JET FLAP SYSTEM.
Patent Application,
J. W. Headley. Filed 14 Nov 72, 10p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Jet flaps, Patents, Wings, Trailing edge, Boundary layer control.
Identifiers: PAT-CL-244-41, *Patent applications.

The patent application relates to a variable angle jet flap for control of aerodynamic flow across an airborne airfoil.

1B. Aeronautics

AD-775 095/3GA PC$9.00/MF$1.45
Toronto Univ (Ontario) Inst for Aerospace Studies
A NUMERICAL STUDY OF THE EFFECTS OF AIRCRAFT MANOEUVERS ON THE FOCUSSING OF SONIC BOOMS,
Ronald O. Onyeonwu. Jul 73, 119p Rept no. UTIAS-192 AFOSR-TR-74-0181
Grant AF-AFOSR-1885-70

Descriptors: *Jet aircraft, *Flight maneuvers, *Sonic boom, *Focusing, Shock waves, Acoustic beams, Ray tracing, Atmosphere models, Mathematical models, Canada.

The effects of aircraft maneuvers on the focusing of sonic booms are investigated for a model atmosphere which is piecewise linear in wind and sound speeds, and piecewise constant in wind direction. Ray-tube areas and trajectories are obtained in closed form for a real atmosphere with winds and aircraft in arbitrary maneuvers. A mathematical formalism is developed for identifying the focusing ray in general maneuvers, leading to a direct and accurate determination of the caustic surface ground intercept. The algorithms derived in the analysis complement those of Hayes to form the basis for a computer program for predicting sonic boom properties. There appears to be a ten-fold reduction in computing time as compared with the Hayes-Haefeli program. (Modified author abstract)

AD-775 208/2GA PC$6.75/MF$1.45
Advisory Group for Aerospace Research and Development Paris (France)
BEHAVIOURAL ASPECTS OF AIRCRAFT ACCIDENTS.
Conference proceedings,
K. G. G. Corkindale. Dec 73, 72p* Rept no. AGARD-CP-132
Presented at the Advisory Group for Aerospace Research and Development Aerospace Medical Panel Specialists Meeting, Held at Soesterberg, Netherlands, on 7 September 1973. NATO furnished.

Descriptors: *Aviation accidents, Sources, *Pilots, *Errors, Prevention, Meetings, Human factors engineering, Simulators, NATO, Cockpits, Job analysis, Performance(Human), Psychological tests, Aviation safety.
Identifiers: *Human error accidents.

Papers are reported on the following subjects: The pilot factor in aircraft accidents, a human factors approach to aircraft accident analysis, the human factor in cyclic accident patterns, the role of the simulator in training, aircrew opinions on cockpit tasks and equipment, psychological aspects of aircraft accident investigation, and cost and factor analysis of pilot error accidents.

AD-775 315/9GA PC$5.00/MF$1.45
Booz-Allen Applied Research Inc Bethesda Md
FORECASTS OF TRANSPACIFIC AIR TRAVEL 1975, 1980, 1985.
Final rept.,
Michael Jay Roberts. Oct 73, 166p FAA-RD-73-58
Contract DOT-FA72WA-3147

Descriptors: *Pacific Ocean, *Air traffic, China, Forecasting, Pacific Ocean islands, Australia, Economics, Passenger aircraft, Cargo aircraft, Sociology.
Identifiers: Gross national product, *Tourist traffic.

The report presents the final results of a study of the economic, social, demographic, geographic, political and technological factors which underlie the growth in transpacific air traffic. The purpose of the study was to develop detailed route segment forecasts of transpacific air traffic to assist the FAA in their assessment of the future need for a setellite communications system. Forecasts were developed for the following traffic segments: Scheduled Passenger, Non-Scheduled Passenger; Scheduled and Non-Scheduled Military Air Charter, All Cargo Service, and General Aviation. The forecasts were further disaggregated to indicate the type of aircraft equipment used and were developed for 1975, 1980 and 1985. (Modified author abstract)

N74-14751/3GA PC$8.00/MF$1.45
Techtran Corp., Silver Spring, Md.
CALCULATION AND ANALYSIS OF AIRCRAFT MOTION.
S. A. Gorbatenko, E. M. Makashov, Y. F. Polushkin, and L. V. Sheftel. Dec 73, 379p NASA-TT-F-757
Contract NASW-2485
Tran-Transl. Into English of the Book "Raschet I Analiz Dvizheniya Letatelnykh Apparatov" Moscow, Mashinostr., 1971 p 1-351.

Descriptors: *Aircraft guidance, *Aircraft performance, *Aircraft stability, *Flight control, Aerodynamic characteristics, Nonlinear systems, Numerical analysis, Systems analysis.

For abstract, see STAR 1206

N74-14752/1GA PC$3.00/MF$1.45
Kansas Univ. Center for Research, Inc., Lawrence.
FLIGHT TEST DATA FOR A CESSNA CARDINAL.
D. L. Kohlman. Jan 74, 35p NASA-CR-2337, FRL-72-001
Contract NGR-17-002-072

Descriptors: *Aircraft configurations, *Aircraft performance, *Aircraft stability, *Cessna aircraft, Aircraft control, Data acquisition, Data processing, Flight tests.

For abstract, see STAR 1206

N74-14760/4GA PC$3.50/MF$1.45
National Aeronautics and Space Administration. Flight Research Center, Edwards, Calif.
PERFORMANCE OF A BALLUTE DECELERATOR TOWED BEHIND A JET AIRPLANE.
J. S. Pyle, J. R. Phelps, and R. S. Baron. Dec 73, 26p NASA-TM-X-56019, H-815

Descriptors: *Aerodynamic drag, *Ballutes, *Drag devices, *F-104 aircraft, *Towed bodies, Aerodynamic characteristics, Aerodynamic stability, Deceleration, Flight tests.

For abstract, see STAR 1206

N74-14764/6GA PC$5.00/MF$1.45
National Aerospace Lab., Tokyo (Japan).
GROUND OPERATION TESTS OF FLYING TEST BED FOR VTOL AIRCRAFT AT NATIONAL AEROSPACE LABORATORY.
N. Takizawa, Y. Tanabe, A. Shibuya, T. Ogawa, and H. Fujieda. 1973, 57p NAL-TR-319
In Japanese; English Summary.

Descriptors: *Flight tests, *Ground effect, *Test equipment, *Vertical takeoff aircraft, Aerodynamic configurations, Data acquisition, Flight characteristics, Hovering.

For abstract, see STAR 1206

N74-14963/4GA PC$3.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
QUESTIONNAIRE SURVEY OF APPROACH LIGHT.
N. Iwataki. Jan 74, 9p NASA-TT-F-15277
Contract NASW-2481
Tran-Transl. Into English from Japan Air Self-Def. Force, Aeromed. Lab. Reports, V. 8, Mar. 1968 p 195-198.

Descriptors: *Airport lights, *Landing aids, *Surveys, Approach, Flash lamps, Glare, Human factors engineering, Low visibility, Military air facilities.

For abstract, see STAR 1206

N74-15378/4GA PC$5.25/MF$1.45
Stanford Univ., Calif. Guidance and Control Lab.

MULTI-INPUT, MULTI-OUTPUT REGULATOR DESIGN FOR CONSTANT DISTURBANCES AND NON-ZERO SET POINTS WITH APPLICATION TO AUTOMATIC LANDING IN A CROSS-WIND.
W. E. Holley, and A. E. Bryson, Jr.. Aug 73, 61p
NASA-CR-136618, SUDAAR-465
Contract NGL-05-020-007

Descriptors: *Aircraft landing, *Automatic landing control, *Optimization, *Wind effects, Control theory, Cross flow, Feedback control, Kalman filters, Linearization.

For abstract, see STAR 1206

PB-228 784/5GA PC$3.00/MF$1.45
National Transportation Safety Board, Washington, D.C.
AIRCRAFT ACCIDENT REPORT - OVERSEAS NATIONAL AIRWAYS, INC. MCDONNELL DOUGLAS DC-8-63, N863F, BANGOR, MAINE, JUNE 20, 1973.
7 Feb 74, 13p NTSB-AAR-74-1

Descriptors: *Aviation accidents, *Accident investigations, Commercial aircraft, Collision research, Takeoff, Civil aviation, Aircraft fires, Tires, Evacuating(Transportation), Casualties.
Identifiers: DC-8 aircraft.

Overseas National Airways Flight 4655, a DC-8-63 in route from Tampa, Florida, to Geneva, Switzerland, via Bangor, Maine, and Amsterdam, the Netherlands, was involved in a takeoff accident at the Bangor International Airport, Bangor, Maine, on June 20, 1973. In the emergency evacuation that followed, 34 of the 251 passengers on board were injured -- 3 of them seriously. The National Transportation Safety Board determines that the probable cause of the accident was the undetected deflation of a right main landing gear tire as the aircraft was taxiing for takeoff.

PB-229 300/9GA PC$4.25/MF$1.45
Department of Transportation, Washington, D.C. Office of Policy Review.
AVIATION COST ALLOCATION STUDY: OVERVIEW OF COST ALLOCATION METHODOLOGIES,
Armando Lago, and James Bradley. Jan 72, 22p Working Paper-1
Prepared in cooperation with Resource Management Corp., Bethesda, Md.

Descriptors: *Civil aviation, *Airports, *Air routes, *Expenses, *Allocations, Cost estimates, Policies, Distributing, Methodologies, Air transportation, Commercial transportation, Terminal air traffic control, Air route traffic control, Operations.

The overview describes the general setting of the cost allocation problem; summarizes the most common methodologies employed in cost allocation studies; and introduces a table which presents an assessment of the alternative methodologies.

PB-229 301/7GA PC$10.25/MF$1.45
Department of Transportation, Washington, D.C. Office of Policy Review.
AVIATION COST ALLOCATION STUDY: FAA AIRPORT AND AIRWAY SYSTEM COST ELEMENTS,
Paul F. Dienemann. Jan 72, 143p Working Paper-2
Prepared in cooperation with Resource Management Corp., Bethesda, Md.

Descriptors: *Civil aviation, *Airports, *Air routes, *Expenses, *Allocations, Cost estimates, Operations, Investments, Facilities, Equipment, Terminal air traffic control, Air route traffic control.

The report is a single-volume compendium of planning factors for estimating the investment and operating costs of all elements of the FAA Airport and Airway System. Unit cost data are presented for all facilities and equipments now in operation or currently being developed. The FAA system of airport and airway facilities, equipment and services is separated into six functional categories and cost tables compiled. Detailed unit cost tables are provided for the following systems: Airports, Terminal control; Enroute control; Flight service; Support; R and D.

PB-229 302/5GA PC$12.00/MF$1.45
Department of Transportation, Washington, D.C. Office of Policy Review.
AVIATION COST ALLOCATION STUDY: AVIATION SAFETY REGULATION COST ALLOCATION STUDY,
Peyton L. Wynns, and Steven Kline. Feb 72, 179p Working Paper-3

Descriptors: *Civil aviation, *Airports, *Air routes, *Expenses, *Allocations, *Aviation safety, Safety, Regulations, Maintenance, Engineering, Research, Cost estimates.

The study systematically develops data on the costs and benefits of the FAA safety regulation program, which is designed to decrease the risk involved in civil aviation. The resulting information provides a basis for policy recommendations as well as for the selection of a particular cost allocation method for associated user charges.

PB-229 303/3GA PC$9.50/MF$1.45
Department of Transportation, Washington, D.C. Office of Policy Review.
AVIATION COST ALLOCATION STUDY: AN AIRPORT AND AIRWAY SYSTEM COST BASE: FAA, DOD, DOS, NASA AND DOT-OST,
Paul Dienemann. Apr 72, 128p Working Paper-4
Prepared in cooperation with Resource Management Corp., Bethesda, Md.

Descriptors: *Civil aviation, *Airports, *Air routes, *Expenses, *Allocations, Cost estimates, Operations, Facilities, Terminal air traffic control, Air route traffic control.

The document represents a cost base which is an accounting of all expenditures by participating agencies and by elements of the system for the period 1966-1975. The document examines the elements of the system according to five functional categories and four cost categories.

PB-229 304/1GA PC$9.25/MF$1.45
Department of Transportation, Washington, D.C. Office of Policy Review.
AVIATION COST ALLOCATION STUDY: MEASURES OF USE,
Ernest Mosbaek. Jul 72, 124p Working Paper-5
Prepared in cooperation with Faucett (Jack) Associates, Inc., Chevy Chase, Md. See also appendix rept. PB-229 305.

Descriptors: *Civil aviation, *Airports, *Air routes, *Expenses, *Allocations, Cost estimates, General aviation aircraft, Terminal air traffic control, Air route traffic control, Research.

The Measures of Use study presents concepts for and numerical estimates of measures of use of airports and airways. A measure of use is defined as any variable which indicates cause of cost. The air system users were divided into 14 user/beneficiary groups and further classified as direct user, indirect user or nonuser. Each category's use of the system was then estimated.

PB-229 305/8GA PC$11.25/MF$1.45
Department of Transportation, Washington, D.C. Office of Policy Review.
AVIATION COST ALLOCATION STUDY: MEASURES OF USE. APPENDIX,
Ernest Mosbaek. Jul 72, 162p Working Paper-5-App
Prepared in cooperation with Faucett (Jack) Associates, Inc., Chevy Chase, Md.

Descriptors: *Civil aviation, *Airports, *Air routes, *Expenses, *Allocations, Cost estimates, Terminal air traffic control, General aviation aircraft.

The paper contains data used to estimate utilization of terminal airway services and data on general aviation subgroups.

PB-229 306/6GA PC$4.75/MF$1.45
Department of Transportation, Washington, D.C. Office of Policy Review.
AVIATION COST ALLOCATION STUDY: EXCISE TAX ON AVIATION TIRES AND TUBES,
Euna L. Edward. Jul 72, 31p Working Paper-6
Prepared in cooperation with the Federal Aviation Administration. Errata included.

Descriptors: *Civil aviation, *Airports, *Air routes, *Expenses, *Allocations, Cost estimates, Revenue, Taxes, Tires, Tire tubes.

The study analyzes annual excise tax revenues from aircraft tires and tubes. It is the most detailed analysis to date of excise revenues and supports the User Tax Revenue Analysis of the Aviation Cost Allocation Study. The major finding is that revenues are approximately one-sixth the amount previously estimated by the FAA.

PB-229 307/4GA PC$8.75/MF$1.45
Department of Transportation, Washington, D.C. Office of Policy Review.
AVIATION COST ALLOCATION STUDY: FORECASTS OF USER TAX REVENUE CONTRIBUTIONS TO THE AIRPORT AND AIRWAY TRUST FUND.
Jul 72, 115p Working Paper-7
Prepared in cooperation with the Westwood Research, Inc.

Descriptors: *Civil aviation, *Airports, *Air routes, *Expenses, *Allocations, Cost estimates, Taxes, Revenue.

The primary finding of the study is that the accrued liability to civil aviation from user taxes generated under the Airport and Airway Revenue Act of 1970 is estimated to be 8650.4 million for 1971 and to reach $962.1 million in 1975. The study contains the results of sensitivity analysis of factors influencing revenues and forecasts tax base measures.

PB-229 310/8GA PC$27.00/MF$1.45
Department of Transportation, Washington, D.C. Office of Policy Review.
AVIATION COST ALLOCATION STUDY: LOCATIONS OF AIRPORT AND AIRWAY SYSTEM COSTS.
Armando Lago. Dec 72, 478p Working Paper-10
Prepared in cooperation with Resource Management Corp., Bethesda, Md.

Descriptors: *Civil aviation, *Airports, *Air routes, *Expenses, *Allocations, Cost estimates, Methodologies.

In order to determine the most equitable method of allocating costs, ten meathodologies were examined, nine of them in detail. These alternative meathodologies differ in their treatment of economic efficiency, ability to pay, full cost recovery, equity, and certain other criteria.

PB-229 311/6GA PC$10.25/MF$1.45
Department of Transportation, Washington, D.C. Office of Policy Review.
AVIATION COST ALLOCATION STUDY: ANALYSIS OF USER TAXES IMPOSED BY THE AIRPORT AND AIRWAY REVENUE ACT OF 1970,
Edgar Battison. Feb 73, 143p Working Paper-11
Prepared in cooperation with Resource Management Corp., Bethesda, Md.

Descriptors: *Civil aviation, *Airports, *Air routes, *Expenses, *Allocations, Cost estimates, Taxes, Revenue.

The study deals with several aspects of the taxes imposed on civil aviation. It investigates such matters as tax incidence, tax burden, comparisons between allocated costs and forecast revenue, and the cost of administering taxes.

PB-229 312/4GA PC$4.75/MF$1.45
Department of Transportation, Washington, D.C. Office of Policy Review.
AVIATION COST ALLOCATION STUDY: NATIONAL TRANSPORTATION SAFETY BOARD,
Steven Kline, and William R. Bowman. Nov 72, 32p Working Paper-12

Descriptors: *Civil aviation, *Airports, *Air routes, *Expenses, *Allocations, Cost estimates, Aviation safety.

The National Transportation Safety Board's share of the costs of the Airport and Airway System are computed. These costs are then attributed to user and non-user groups according to alternative cost allocation methodologies.

PB-229 313/2GA PC$6.00/MF$1.45
Department of Transportation, Washington, D.C. Office of Policy Review.
AVIATION COST ALLOCATION STUDY: NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION,
L. Carl Woehlcke. Nov 72, 60p Working Paper-13
Prepared in cooperation with Faucett (Jack) Associates, Inc., Silver Spring, Md.

Descriptors: *Civil aviation, *Airports, *Air routes, *Expenses, *Allocations, Cost estimates, Weather observation, Weather forecasting, Aeronautical navigation charts.

The report contains discussions of alternative allocation methods and presents data on cost and use that will permit implementation of alternative allocation methods applicable to weather services and aeronautical charting and cartography costs services provided aviation by the National Oceanic and Atmospheric Administration (NOAA).

PB-229 314/0GA PC$8.75/MF$1.45
Department of Transportation, Washington, D.C. Office of Policy Review.
AVIATION COST ALLOCATION STUDY: UNITED STATES COAST GUARD,
L. Carl Woehlcke. Nov 72, 113p Working Paper-14
Prepared in cooperation with Faucett (Jack) Associates, Inc., Silver Spring, Md.

Descriptors: *Civil aviation, *Airports, *Air routes, *Expenses, *Allocations, Cost estimates, Coast Guard, Search and rescue, Rescue operations, Loran, Radio beacons.

The Coast Guard's share of the costs of the Airport and Airway System are computed. These costs are then attributed to user and non-user groups according to alternative cost allocation methodologies.

PB-229 315/7GA PC$18.50/MF$1.45
Department of Transportation, Washington, D.C. Office of Policy Review.
AVIATION COST ALLOCATION STUDY: SOCIO-ECONOMIC APPROACH TO BENEFITS OF THE AIRPORT AND AIRWAY SYSTEM,
Eugene Beard. Jun 72, 306p Working Paper-15
Prepared in cooperation with BLK Group, Inc., Washington, D.C.

Descriptors: *Civil airation, *Airports, *Air routes, *Expenses, *Allocations, Cost estimates, Surveys, Public opinion, Travel, Socioeconomic status, Communities, Aircraft noise.

The study examines the nature and extent of general public benefits of the airport and airway system. Benefits and/or diabenefits accruing to the general public and to individuals other than users (passengers and freight customers) and other direct beneficiaries (employees, etc.) of the airport and airway system were identified and measured.

PB-229 316/9GA PC$9.00/MF$1.45
Department of Transportation, Washington, D.C. Office of Policy Review.
AVIATION COST ALLOCATION STUDY: VIEWS OF THE USERS,
Bernestine Allen, and Samuel A. LaMar. Apr 73, 120p Working Paper-16

Descriptors: *Civil aviation, *Airports, *Air routes, *Expenses, *Allocations, Cost estimates, Taxes, Revenue.

One requirement of the Airport and Airway Development Act of 1970 is to conduct a study of the system costs and consult with users of the system to obtain their views on cost allocation and taxation concepts. In fulfilling the requirement, there have been meetings with the users of the system; and reports on each phase of the study have been distributed as working papers to all interested parties. The report summarizes views expressed at the meetings, as well as written comments received from the users.

PB-229 317/3GA PC$5.25/MF$1.45
Department of Transportation, Washington, D.C. Office of Policy Review.
AVIATION COST ALLOCATION STUDY: CIVIL AERONAUTICS BOARD,
William R. Bowman. Jan 73, 45p Working Paper-17

Descriptors: *Civil aviation, *Airports, *Air routes, *Expenses, *Allocations, Cost estimates, Regulations, Rates(Costs), Agreements.

The share of the costs of the Airport and Airway System are computed. These costs are then attributed to user and non-user groups according to alternative cost allocation methodologies.

PB-229 318/1GA PC$5.00/MF$1.45
Department of Transportation, Washington, D.C. Office of Policy Review.
AVIATION COST ALLOCATION STUDY: THE PRICE ELASTICITY OF DEMAND FOR GENERAL AVIATION,
Edgar Battison. Dec 72, 38p Working Paper-18
Prepared in cooperation with Resource Management Corp., Bethesda, Md.

Descriptors: *Civil aviation, *Airports, *Air routes, *Expenses, *Allocations, Prices, Demand(Economics), Rates(Costs).

The paper analyzes the nature of demand response to costs, by users in general aviation. It applies regression analysis to information from a California survey of general aviation on the utilization of aircraft. For the six classes of general aviation, business flights proved to be the most inelastic and instructional flights the least. Overall, it was concluded that demand is inelastic and therefore use will decline proportionately less than price or cost increases.

1C. Aircraft

AD-774 831/2GA PC$7.25/MF$1.45
Borst (Henry V) and Associates Rosemont Pa
SUMMARY OF PROPELLER DESIGN PROCEDURES AND DATA. VOLUME I. AERODYNAMIC DESIGN AND INSTALLATION.
Technical rept.,
Henry V. Borst. Nov 73, 323p USAAMRDL-TR-73-34A
Contract DAAJ02-72-C-0033
Errata sheet inserted. See also Volume 2, AD-774 836.

Descriptors: *Vertical takeoff aircraft, *Propellers(Aerial), Short takeoff aircraft, Aerodynamics, Dual rotation propellers, Geometry, Optimization, Propeller blades.
Identifiers: *Design criteria.

The technology needed for the design and installation of propellers is presented and summarized in three volumes. Volume I (Aerodynamic Design and Installation) contains the basic theory and necessary design procedures for establishing the external geometry and performance of any propeller. The procedures and data which apply for both single and dual rotation propellers are established for the entire range of flight conditions. The performance of propellers operating at off design condition, high values of shaft angle of attack and negative thrust condition is given. (Author)

AD-774 836/1GA PC$8.25/MF$1.45
Borst (Henry V) and Associates Rosemont Pa
SUMMARY OF PROPELLER DESIGN PROCEDURES AND DATA. VOLUME II. STRUCTURAL ANALYSIS AND BLADE DESIGN.
Final technical rept.,
William Amatt, William E. Bates, and Henry V. Borst. Nov 73, 381p USAAMRDL-TR-73-34B
Contract DAAJ02-72-C-0033
See also Volume 1, AD-774 831.

Descriptors: *Vertical takeoff aircraft, *Propellers(Aerial), Short takeoff aircraft, Aerodynamics, Propeller blades, Geometry, Fabrication, Optimization.
Identifiers: *Design criteria.

The technology needed for the design and installation of propellers is presented and summarized in three volumes. Volume 2 (Structural Analysis and Blade Design) contains the theory and data for the detailed structural and vibration analysis of propellers. Included are estimating procedures for initial design purposes; the details for designing solid, hollow, and composite blades; and manufacturing techniques used. (Author)

AD-774 874/2GA PC$3.00/MF$1.45
Naval Air Development Center Warminster Pa Air Vehicle Technology Dept
NAVAIRDEVCEN GRAPHITE-EPOXY COMPOSITE WING FOR BQM-34E: AEROELASTIC ANALYSIS.
Final rept.,
Allan R. Somoroff, and Herman Rubin. 12 Nov 73, 19p Rept no. NADC-73233-30

Descriptors: *Wings, Aeroelasticity, Composite materials, Epoxy resins, Graphite, Target drones, Flutter, Supersonic airfoils.
Identifiers: BQM-34 drones.

A final aeroelastic analysis of the NAVAIRDEVCEN advanced graphite-epoxy composite wing for the unmanned supersonic BQM-34E aerial target indicates flutter free behavior within the 15% margin flight envelope. The wing is also divergent free throughout the flight regime and exhibits an expected forward and inboard shift of the aerodynamic center of pressure. (Author)

AD-775 007/8GA PC$4.00/MF$1.45
Advisory Group for Aerospace Research and Development Paris (France)
AN OVERVIEW OF US ARMY HELICOPTER STRUCTURES RELIABILITY AND MAINTAINABILITY,
Thomas L. House. 1973, 20p Rept no. AGARD-R-613
Presented at Meeting of the Structures and Materials Panel (SMP) (36th), Milan 2-6 Apr 73. NATO furnished.

Descriptors: *Army aircraft, *Helicopters, Maintenance, Reliability, Maintainability, Rotor blades, Airframes.

The purpose of the report is to provide a quantitative and qualitative review of U.S. Army helicopter structure reliability and maintainability problems and subsequently to discuss related reliability and maintainability efforts that are expected to provide solutions. For the purpose of this paper, helicopter structures are deemed to include rotor blades as well as primary and secondary elements of the airframe. Structural aspects of other components (engines, gearboxes, etc.) are normally addressed in conjunction with other items related to the component and are not discussed.

AD-775 009/4GA PC$6.25/MF$1.45
Advisory Group for Aerospace Research and Development Paris (France)
ACOUSTIC FATIGUE DESIGN DATA. PART III.
AGARDograph rept.,
A. G. R. Thomson, and R. F. Lambert. Dec 73, 63p
Rept no. AGARD-AG-162-Pt-3
NATO furnished.

Descriptors: *Sonic fatigue, *Airframes, Titanium, Titanium alloys, Structural members, Structures, Aerospace craft, Damping, Panels, Stresses, Skin(General).

Contents:
- Endurance of titanium and titanium alloy structural elements subjected to simulated acoustic loading;
- Damping in acoustically excited structures;
- Reference frequency of panel with flexible stiffeners;
- The estimation of R.M.S. stress in skin panels with flexible stiffeners subjected to random acoustic loading.

AD-775 075/5GA PC$3.00/MF$1.45
Advisory Group for Aerospace Research and Development Paris (France)
INTERFERING LIFTING SURFACES IN UNSTEADY SUBSONIC FLOW - COMPARISON BETWEEN THEORY AND EXPERIMENT.
Juergen Becker. Jan 74, 20p Rept no. AGARD-614 Supplement to AD-274 097. Presented at the AGARD Structures and Materials Panel Meeting (37th) Held in The Hague (Netherlands) 7-12 Apr 73. NATO furnished.

Descriptors: *Aerodynamic control surfaces, *Aerodynamic forces, Subsonic flow, Wing body configurations, Flutter, Tail assemblies, Angle of attack, Aeroelasticity.
Identifiers: T tails.

The ever increasing use of highly swept wings, T-shaped tail units and variable geometry wings has rendered it necessary to take account of aerodynamic interactions between the aircraft lifting surfaces in flutter computations and this has given rise to many theoretical developments. However, the unsteady forces thus calculated have seldom been verified in wind-tunnel tests. The author has undertaken to carry out such tests on a half wing unit consisting of a variable sweep half-wing, followed at a short distance by a fixed sweep half tail-unit. These quasi-rigid models are subjected to harmonic pitch and roll oscillations. Up to now, tests have only been performed at low speeds (from 20 to 40 m/s) corresponding to a practically incompressible flow. Such tests should also be conducted at subsonic and supersonic speeds.

AD-775 199/3GA PC$3.00/MF$1.45
Ministry of Defence London (England) Director of Research Materials 2 (Air Systems)
MATERIALS FOR AEROSPACE CURRENT RESEARCH AND DEVELOPMENT.
Jun 73, 18p Rept no. D Mat-194 DRIC-BR-38305

Descriptors: *Aircraft, Alloys, Metals, Plastics, Glass, Elastomers, Fuels, Lubricants, Paints, Great Britain.

The report outlines current trends in materials research and development aimed at satisfying aerospace objectives. It then indicates progress in a wide range of metallic and non-metallic materials required for airframes, aeroengines and aircraft systems. (Author)

AD-775 201/7GA PC$27.25/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
MEANS OF CONTROLLING AIRCRAFT.
Yu. I. Dukhon, and N. N. Ilinskii. 7 Jan 74, 495p
Rept no. FTD-MT-24-317-73
Edited machine trans. of mono. Sredstva Upravleniya Letetelnymi Apparatami, n.p., 1972 p1-430, by Joseph E. Pearson.

Descriptors: *Aircraft, *Flight control systems, Avionics, Electronic equipment, Communication and radio systems, Navigational aids, Air traffic control systems, Translations, USSR.

The report sets forth in detail the features of the structure and the conditions for the effective use of radio communication, radio navigation, radar equipment, landing systems and automated control and guidance systems for the purpose of controlling aircraft. In writing this book the authors used unclassified materials from the foreign and domestic press. The book is intended for flight and technical and engineering personnel of aviation, and also for all readers who are interested in aviation technology.

AD-775 246/2GA PC$4.50/MF$1.45
Honeywell Inc Minneapolis Minn Systems and Research Center
F-14 OPTIMUM FLIGHT MODES. VOLUME I.
Final rept. 1 Jul 72-30 Sep 73,
D. C. Sederstrom, and K. L. Curtner. Oct 73, 119p
Contract N00014-72-C-0405

Descriptors: *Jet fighters, *Mission profiles, *Energy management, Operations research, Real time, Optimization, On line systems, Algorithms, Computer programs, Display systems, Jet engine fuels, Fuel consumption, Aeronautics, Mathematical models.
Identifiers: *F-14 aircraft, F-14A aircraft, *Flight modes.

An F-14 optimum flight modes study is described. The overall objective of the project was to define an energy management demonstration system which could use the F-14A with its existing computer systems as a flight test vehicle. The work included development of a computer program to determine performance and generate trajectories for various energy management modes. An energy management demonstration system is presented, the computational algorithm is described, and potential performance benefits resulting from the use of an energy management system are discussed. (Author)

AD-775 383/3GA PC$18.25/MF$1.45
Battelle Columbus Labs Ohio Tactec
BALLOON TECHNOLOGY DATA BASE. VOLUME II. INDEX.
Research rept.,
E. E. Westbrook, J. E. Mortland, and E. N. Wyler. Oct 73, 303p
Sponsored in part by Advanced Research Projects Agency, Arlington, Va. See also Volume 1, AD-769 284.

Descriptors: *Balloons, *Data bases, Symposia, Inflatable structures, Ground support equipment, Payload, Scientific research, Indexes, Technology.

The compilation is made up of extracts representing documents held in the Balloon Technology Data Base. It is presented in two separately bound volumes: Volume I - Report Extracts and Volume II - Index. Volume 2 is a computer-generated index of the extracts in Volume 1. Each extract has been indexed by authors and appropriate terms. Although no Thesaurus has been developed, and effort has been made to maintain consistency in the use of terms. The citations accompanying each term are complete; it was thought that this would give the searcher more information upon which to base his decisions than would a simple accession number or title.

AD-775 391/6GA PC$6.50/MF$1.45
Boeing Vertol Co Philadelphia Pa
TAIL ROTOR DESIGN GUIDE.
Final rept. Nov 72-Aug 73,
Wayne Wiesner, and Gary Kohler. Jan 74, 256p
Rept no. D210-10687-1 USAAMRDL-TR-73-99
Contract DAAJ02-73-C-0010

Descriptors: *Tail helicopter rotors, Experimental design, Thrust, Flow fields, Aerodynamic forces, Optimization, Numerical analysis.
Identifiers: *Design criteria.

The report presents general guidelines for the preliminary design of tail rotors for single-rotor helicopters in low-speed and hover flight. Application of these guidelines should alleviate the directional control problems of single-rotor helicopters under certain conditions of wind speed and direction, height above the ground, gross weight, and altitude. The main data base used to develop the guidelines is the results of a wind tunnel test of a tail rotor helicopter model conducted by Boeing. These tests were conducted in and out of ground effect, in various wind speeds to 35 knots, and with varying wind azimuths. (Modified author abstract)

AD-775 418/7GA PC$3.00/MF$1.45
Texas Engineering Experiment Station College Station
APPLICATION TO ROTARY WINGS OF A SIMPLIFIED AERODYNAMIC LIFTING SURFACE THEORY FOR UNSTEADY COMPRESSIBLE FLOW.
Final rept. (Part 1),
Balusu M. Rao, and William P. Jones. Jan 74, 12p
Rept no. TEES-3023-74-01 AROD-12156.1-E
Grant DAHC04-74-G-0041
Presented at the AHS/NASA-Ames Specialists' Meeting on Rotocraft Dynamics, 13-15 Feb 74.

Descriptors: *Rotary wings, *Lifting surfaces, Airfoils, Aerodynamic characteristics, Flutter, Oscillation, Subsonic flight.

In a recent paper, Jones and Moore have developed a simple numerical lifting surface technique for calculating the aerodynamic coefficients on oscillating wings in subsonic flight. The method is based on the use of the full lifting surface theory and is not restricted in any way as to frequency, mode of oscillation or aspect ratio when M less than 1. In this study, this simple but general method of predicting airloads is applied to helicopter rotor blades on a full three-dimensional basis. (Modified author abstract)

AD-775 449/3GA PC$3.00/MF$1.45
Army Aviation Systems Command St Louis Mo
MAJOR ITEM SPECIAL STUDY (MISS), CH-47A HUDRAULIC SERVOCYLINDER.
Interim rept. 1 Jan 64-1 Jul 73.
Feb 74, 21p Rept no. USAAVSCOM-TR-74-10

Descriptors: *Helicopters, *Hydraulic cylinders, *Value engineering, Logistics support, Quality control, Spare parts, Maintainability, Cost analysis, Failure.
Identifiers: MISS(Major Item Special Studies), Major item special studies, H-47 aircraft, CH-47 aircraft, *Logistics management, Failure analysis.

Major Item Special Study (MISS) reports are performed on DA Form 2410 reportable components. These are time change in items and certain condition change items selected because of high cost or need for intensive management. Basically, the MISS reports are concerned with analyzing reported removal data presented in the Major Item Removal Frequency report. The failure modes reported for each removal are examined and grouped into categories which are intended to clarify the intent of the data reporting. From the data, removal distributions can be plotted and an MTR (mean time to removal) can be calculated. The MISS reports then investigate possible cost savings based on total elimination of selected failure modes. These modes are chosen because of the percentage of failures they represent and/or because they appear to be feasible Product Improvement Program areas. (Author)

AD-775 455/9GA PC$20.50/MF$1.45
Federal Aviation Administration Washington D C
SAFETY THRU EFFECTIVE MAINTENANCE.
9 Dec 71, 349p
Proceedings of the Annual FAA International Aviation Maintenance Symposium (7th) Held at Oklahoma City, Okla., on December 7, 8, and 9, 1971. See also report dated Dec 70, AD-746 353.

Descriptors: *Aviation safety, *Symposia, *International, *Maintainability, Quality, Aircraft maintenance, Methodology, Standards, Altimeters, Avionics, Inspection, Optics, Engines, Vibration, Failure, Predictions.
Identifiers: Boeing 747 aircraft, Optical processing, Lockheed 1011 aircraft, DC-10 Aircraft, CF6-6 engines.

An aircraft maintenance symposium is reported covering such topics as personalized maintenance, analytical techniques, maintainability measurement, safety standards, instrumentation, failure prediction, maintenance quality, inspection responsibilities, aircraft structures, and engine operations.

AD-775 463/3GA PC$3.25/MF$1.45
Army Land Warfare Lab Aberdeen Proving Ground Md
IMPROVED ELEVATED SITE MARKER.
Final rept. Apr 70-Oct 73,
Benjamin F. Wood. Dec 73, 43p Rept no. LWL-TR-74-07

Descriptors: *Balloons, *Markers, Close support, Aerial reconnaissance, Target designators, Visibility, Air drop operations.

There has been a continuing need for an efficient position marking device for use in heavily forested areas by personnel of all three services. The position marking device must enable personnel on the ground, under a heavily forested canopy, to make known their precise location to friendly and support aircraft overhead. The needs of the three services are similar, but vary according to the function of each. The Naval Air Arm and Air Force require a fast acting, lightweight device that can mark the position of downed airmen for air rescue teams. The Army and Marine Corps depend upon position marking for medical evacuation, resupply and direct fire support and, therefore, require a longer lasting marker. Speed of deployment, while valuable, is not as essential to ground units as for the downed airmen. The development described in the report is of a system designed for ground units and is not directly applicable to the downed airmen problem.

N74-14749/7GA PC$3.25/MF$1.45
Institute of Transport Aviation, Paris (France).
AVIATION NEEDS AND PUBLIC CONCERNS.
E. Vanlenner. 29 Oct 73, 22p
Conf-Presented at 7TH Dr. Albert Plesman Mem. Lecture, Delft, Netherlands, 29 Oct. 1973.

Descriptors: *Aircraft industry, *Civil aviation, *Environmental control, *Europe, *Social factors, Air traffic control, Aircraft noise, Energy sources, Environment pollution.

For abstract, see STAR 1206

N74-14750/5GA PC$6.00/MF$1.45
Edizioni Museo Aeronautico Caproni di Taliedo, Rome (Italy).
FORTY YEARS OF CIVIL AVIATION, 1931 - 1971 QUARANTANNI DI AVIAZIONE CIVILE, 1931 - 1971.
M. Quilici. 1973, 77p
Language in Italian.

Descriptors: *Civil aviation, *Italy, Commercial aircraft, Histories.

For abstract, see STAR 1206

N74-14754/7GA PC$3.50/MF$1.45
General Electric Co., Pittsfield, Mass.
ANALYSIS AND CALCULATION OF LIGHTNING-INDUCED VOLTAGES IN AIRCRAFT ELECTRICAL CIRCUITS.
Final Report.
J. A. Plumer. Jan 74, 65p NASA-CR-2349, SRD-72-066
Contract NAS3-14836

Descriptors: *Aircraft equipment, *Circuits, *Electric equipment, *F-89 aircraft, *Lightning, *Transfer functions, Aircraft design, Computer programs, Electrical properties, Numerical analysis.

For abstract, see STAR 1206

N74-14762/0GA PC$6.75/MF$1.45
General Dynamics/Convair, San Diego, Calif. Convair Aerospace Div.
COMPUTER PROGRAM TO PERFORM COST AND WEIGHT ANALYSIS OF TRANSPORT AIRCRAFT. VOLUME 1: SUMMARY.
Final Report.
Nov 73, 92p NASA-CR-132361
Contract NAS1-11343

Descriptors: *Aircraft design, *Computerized design, *Cost analysis, *Transport aircraft, *Weight analysis, Aerodynamic configurations, Airframes, Structural analysis.

For abstract, see STAR 1206

N74-14763/8GA PC$11.25/MF$1.45
General Dynamics/Convair, San Diego, Calif. Convair Aerospace Div.
COMPUTER PROGRAM TO PERFORM COST AND WEIGHT ANALYSIS OF TRANSPORT AIRCRAFT. VOLUME 2: TECHNICAL VOLUME.
Final Report.
Nov 73, 185p NASA-CR-132362
Contract NAS1-11343

Descriptors: *Aircraft design, *Computerized design, *Transport aircraft, *Weight analysis, Airframes, Computer programs, Cost analysis, Structural analysis.

For abstract, see STAR 1206

N74-14765/3GA PC$3.75/MF$1.45
Boeing Vertol Co., Philadelphia, Pa.
A STUDY OF THE EFFECT OF FLIGHT DENSITY AND BACKGROUND NOISE ON V/STOL ACCEPTABILITY.
Final Report.
H. Sternfeld, Jr., E. G. Hinterkeuser, R. B. Hackman, and J. Davis. Jan 74, 84p NASA-CR-2197, D210-10662-2
Contract NAS1-11607

Descriptors: *Acoustic measurements, *Acoustic properties, *Aircraft noise, *Short takeoff aircraft, Effective perceived noise levels, Human factors engineering, Psychological effects.

For abstract, see STAR 1206

N74-15594/6GA PC$4.00/MF$1.45
Technion - Israel Inst. of Tech., Haifa. Dept. of Aeronautical Engineering.
NOTCH SENSITIVITY AND FATIGUE STRENGTH OF AIRCRAFT SHEET MATERIAL SPECIMENS.
A. Buch. 1973, 39p TAE-184

Descriptors: *Fatigue tests, *Metal sheets, *Notch sensitivity, Aircraft parts, Cladding, High strength alloys, Notch strength, Plating, Stress concentration.

For abstract, see STAR 1206

PAT-APPL-328 158 PC$4.00/MF$1.45
Department of the Air Force Washington D C
ROTOR BLADE CAPTURING ASSEMBLY.
Patent Application,
Edward Hibyan. Filed 30 Jan 73, 11p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Folding helicopter rotors, *Locking fastener devices, Rotor blades(Rotary wings), Patents, Safety devices, Inflight.
Identifiers: *Patent applications, PAT-CL-244-17-11.

The patent application relates to a fail-safe assembly for releasably capturing and holding rigidly, in a folded position, the sections of a two-section foldable rotor blade of a rotary wing-type aircraft while the aircraft is in forward flight and irrespective of the pitch of the rotor blade. The assembly includes a male member attached to the trailing edge of the outboard section of the rotor blade; a complementary female member attached to the trailing edge of the inboard section of the rotor blade; and, means for permitting the releasable capture of the male member within the female member.

PAT-APPL-338 728 PC$5.00/MF$1.45
Department of the Air Force Washington D C
IMPROVED AIR GENERATING MECHANISM FOR AN AIRCRAFT AIR CUSHION TAKEOFF AND LANDING SYSTEM.
Patent Application,
Joseph E. Krysiak. Filed 7 Mar 73, 37p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Air cushion vehicles, *Landing aids, Patents, Air, Inlets, Ducts, Solid rocket propellants.
Identifiers: *Patent applications, PAT-CL-180-7.

The patent application relates to a turbine driven fan assembly containing solid rocket propellant and nozzle assemblies. The device is used to supplement the gas flow in an air cushion landing device.

1D. Aircraft Flight Control and Instrumentation

AD-775 454/2GA PC$5.00/MF$1.45
Boeing Commercial Airplane Co Seattle Wash
DEVELOPMENT OF AN INDEPENDENT ALTITUDE MONITOR CONCEPT.
Final technical rept. 9 Feb-9 Sep 73,
Donald L. Parks, Maxie M. Hayashi, and James R. Fries. Sep 73, 159p Rept no. D6-41293 FAA-RD-73-168
Contract DOT-FA73WA-3233

Descriptors: *Flight instruments, *Altimeters, Landing aids, Approach, Altitude, Terminal flight facilities, Head up displays, Aviation safety.
Identifiers: IAM(Independent Altitude Monitors), Independent altitude monitors.

The purposes of this study were fourfold: to examine the problems relating to inadvertent terrain strikes (altitude-related accidents) in the terminal area, determine requirements for an Independent Altitude Monitor (IAM), identify candidate concepts, and perform a technological appraisal of these concepts for possible development requirements. Study concepts were to consider a full range of aircraft and airport capabilities. Additionally, alert system concepts were reviewed for possible applications. Several existing and relatively short-term concepts were identified that offered significant IAM benefits. These covered altitude, path control, and improved position data, including altitude alert, minimum decision altitude alert, terrain proximity warning, ARTS III alert, visual aids, and distance-measuring equipment. Longer range development is necessary to satisfy all IAM requirements. Systems now under development offer basic elements of this capability.

1E. Air Facilities

AD-774 784/3GA PC$4.00/MF$1.45
Mitre Corp Mclean Va
FAA REPORT ON AIRPORT CAPACITY. VOLUME I. NATIONAL SUMMARY.
Jan 74, 98p* Rept no. M74-12-Vol-1 FAA-EM-74-5-1
Contract DOT-FA70WA-2448
See also AD-774 789.

Descriptors: *Terminal flight facilities, *Airports, *Planning, Urban areas, Air traffic control terminal areas, Runways, International airports, Instrument flight, All weather aviation, Wake, Turbulence.
Identifiers: *Turbulent wake.

The report analyzes the impact of FAA programs on airport capacity over the next ten years. The results are reported in two volumes. The first volume forms a summary of the findings of the study; the second volume presents the detailed examinations of each of the selected airports. Eight major airports (Atlanta, Chicago O'Hare, Denver, Los Angeles, Miami, New York Kennedy, Philadelphia, and San Francisco) were examined in detail. The airside capacity of these airports can be extended, within the present E and D and F and E framework, to meet projected demand for the mid to late 1980's. Under current and proposed plans, most of the surveyed airports will have exceeded their landside capacity before these air traffic levels are reached. The problems are primarily physical access/egress/parking limitations. These will require new access concepts and possibly new major airports which should be planned for now. (Modified author abstract)

AD-774 789/2GA PC$6.75/MF$1.45
Mitre Corp Mclean Va
FAA REPORT ON AIRPORT CAPACITY. VOLUME II. EIGHT AIRPORT SURVEY.
Jan 74, 293p* Rept no. M74-12-Vol-2 FAA-EM-74-5-2
Contract DOT-FA70WA-2448
See also AD-774 784.

Descriptors: *Terminal flight facilities, *Airports, *Planning, Urban areas, Air traffic control terminal areas, Runways, International airports, Instrument flight, All weather aviation, Wake, Turbulence.
Identifiers: *Turbulent wake.

The report analyzes the impact of FAA programs on airport capacity over the next ten years. Eight major airports (Atlanta, Chicago O'Hare, Denver, Los Angeles, Miami, New York Kennedy, Philadelphia, and San Francisco) were examined in detail. The study found that these programs will have substantial benefits at the airports surveyed. VFR capacities will increase about 25% over today, and IFR about 50%. A major requirement will be the metering and spacing and wake vortex avoidance systems programs. With these systems in place, IFR capacity will rise from its present level of 75% of VFR capacity to about 90%, thus increasing the ability to maintain sustained all-weather operations. If these improvements are achieved, no airport surveyed will in the long term (1979-82) experience peak hour VFR saturation, and only one airport is projected to experience peak hour IFR saturation. (Modified author abstract)

AD-775 154/8GA PC$3.25/MF$1.45
Air Force Weapons Lab Kirtland AFB N Mex
EVALUATION OF RUNWAY SKID-RESISTANCE CHARACTERISTIC AT ROYAL AIR FORCE ALCONBURY, ENGLAND.
Final rept. 1 Nov 72-30 Jun 73,
George D. Ballentine, and Phil V. Compton. Feb 74, 37p Rept no. AFWL-TR-73-260

Descriptors: *Pavements, *Runways, *Skidding, Military facilities, Landing fields, Friction, Test methods, Surfaces, Moisture, Porosity, Acceptability, Performance(Engineering), Great Britain.
Identifiers: *Hydroplaning.

The data collected during the Air Force Weapons Laboratory's standard skid-resistance test conducted at Royal Air Force Alconbury, England on 20 November 1972 are analyzed. The test results indicate the porous friction surface at Royal Air Force Alconbury had good skid-resistance properties, and no corrective action was indicated at the time of the test. (Author)

AD-775 155/5GA PC$3.25/MF$1.45
Air Force Weapons Lab Kirtland AFB N Mex
EVALUATION OF RUNWAY SKID-RESISTANCE CHARACTERISTIC AT ROYAL AIR FORCE WOODBRIDGE, ENGLAND.
Final rept. 1 Nov 72-30 Jun 73,
George D. Ballentine, and Phil V. Compton. Feb 74, 35p Rept no. AFWL-TR-73-261

Descriptors: *Pavements, *Runways, *Skidding, Military facilities, Landing fields, Surfaces, Test methods, Stopping, Friction, Moisture, Acceptability, Performance(Engineering), Great Britain.
Identifiers: *Hydroplaning.

Data gathered during the Air Force Weapons Laboratory's standard skid-resistance test conducted at Royal Air Force (RAF) Woodbridge, England, on 26 November 1972 are analyzed. The test results indicate the runway surface at RAF Woodbridge had generally good skid-resistance properties, and no corrective action was indicated at the time of the test. Because the measured stopping-distance ratios put the runway surface at the edge of the range for good skid-resistance properties, the runway surface should be retested in approximately 18 months. (Author)

AD-775 156/3GA PC$3.25/MF$1.45
Air Force Weapons Lab Kirtland AFB N Mex
EVALUATON OF RUNWAY SKID-RESISTANCE CHARACTERISTIC AT BITBURG AIR BASE, GERMANY.
Final rept. 1 Nov 72-30 Jun 73,
George D. Ballentine, and Phil V. Compton. Feb 74, 43p Rept no. AFWL-TR-73-262
See also report dated Feb 74, AD-775 157.

Descriptors: *Pavements, *Runways, *Skidding, Military facilities, Landing fields, Performance(Engineering), Test methods, Surfaces, Statistical data, Acceptability, Germany(East and West).
Identifiers: *Bitburg Air Base, Hydroplaning.

Data gathered during the Air Force Weapons Laboratory's standard skid-resistance test conducted at Bitburg AB, Germany, on 12 November 1972 are analyzed. The test results indicate the runway surface had good skid-resistance properties, and no corrective action was indicated at the time of the test. (Author)

AD-775 157/1GA PC$3.25/MF$1.45
Air Force Weapons Lab Kirtland AFB N Mex
EVALUATION OF RUNWAY SKID-RESISTANCE CHARACTERISTIC AT HAHN AIR BASE, GERMANY.
Final rept. 1 Nov 72-30 Jun 73,
George D. Ballentine, and Phil V. Compton. Feb 74, 34p Rept no. AFWL-TR-73-263
See also report dated Feb 74, AD-775 156.

Descriptors: *Pavements, *Runways, *Skidding, Military facilities, Landing fields, Performance(Engineering), Test methods, Surfaces, Friction, Acceptability, Germany(East and West).
Identifiers: *Hahn Air Base, Hydroplaning.

Data gathered during the Air Force Weapons Laboratory's standard skid-resistance test conducted at Hahn AB, Germany, on 15 November 1972 are analyzed. The test results indicate the porous friction surface at Hahn AB had good skid-resistance properties, and no corrective action was indicated at the time of the test. (Author)

AD-775 365/0GA PC$3.75/MF$1.45
Air Force Weapons Lab Kirtland AFB N Mex
C-130 LANDINGS ON XM-18B LANDING MAT, OAK GROVE AUXILIARY AIR FIELD, NORTH CAROLINA.
Final rept. Feb-May 73,
H. R. Marien. Feb 74, 69p Rept no. AFWL-TR-73-254

Descriptors: *Landing fields, *Aircraft landings, *Landing mats, Forward areas, Runways, Joints, Load distribution, Panels, Anchors(Structural).
Identifiers: C-130 aircraft, M-18 landing mats, XM-18B landing mats.

During March and April 1973, a large number of C-130 aircraft operations were conducted on an XM-18B landing-mat runway at Oak Grove Auxiliary Air Field, North Carolina. Detailed measurements were made to determine the lateral and longitudinal movement of the mat at the conclusion of each day's operations. The methods used to make these measurements, the data collected, an analysis of the data and recommendations for future efforts to measure landing-mat movement are presented. Although there were no landing-mat failures at Oak Grove AAF, the 60-by-3500-foot runway did move as much as 13 inches. Transverse bowing, vertical movement, and random lateral shifting were observed and documented. (Author)

AD-775 406/2GA PC$3.25/MF$1.45
Army Engineer Waterways Experiment Station Vicksburg Miss
SMALL APERTURE TESTING FOR AIRFIELD PAVEMENT EVALUATION.
Final rept.,
Jim W. Hall, Jr., and Darrell R. Elsea. Feb 74, 35p Rept no. AEWES-Misc-Paper-S-74-3

Descriptors: *Pavements, *Runways, *Apertures, Test methods, Military facilities, Landing fields, Physical properties, Loads(Forces), Performance(Engineering), Moisture, Density, Classification, Trafficability, Non-destructive testing.
Identifiers: Aperture tests.

The high intensity of aircraft operations on most military airfields prohibits the closing of runways and other pavement facilities in order to measure the physical properties of the pavement necessary to evaluate its load-carrying capability. Also, the introduction of multiple-wheel heavy gear load aircraft coupled with an ever increasing number of aircraft operations has emphasized the need to know the load-carrying capability of pavement

structures and to anticipate future pavement performance. The objective of this study was to develop techniques for determination of the required pavement properties that can be used with a minimum of pavement destruction and interference with aircraft operations.

2. AGRICULTURE

2C. Agricultural Engineering

E74-10312 PC$4.00/MF$1.45
Wyoming Univ., Laramie. Dept. of Geology.
IDENTIFICATION OF IRRIGATED CROP TYPES FROM ERTS-1 DENSITY CONTOUR MAPS AND COLOR INFRARED AERIAL PHOTOGRAPHY.
Special rept.,
Ronald W. Marrs, and Michael A. Evans. 15 Jan 74, 16p ERTS-1-574-1 NASA-CR-13679
Contract NAS5-21799
Original contains imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S.D. 57198.

Descriptors: Crop identification, Wyoming, Irrigation, Infrared photography, Color photography, Earth resources program, Photomapping, Annual variations, Agriculture, Aerial photography.

The author has identified the following significant results. The crop types of a Great Plains study area were mapped from color infrared aerial photography. Each field was positively identified from field checks in the area. Enlarged (50x) density contour maps were constructed from three ERTS-1 images taken in the summer of 1973. The map interpreted from the aerial photography was compared to the density contour maps and the accuracy of the ERTS-1 density contour map interpretations were determined. Changes in the vegetation during the growing season and harvest periods were detectable on the ERTS-1 imagery. Density contouring aids in the detection of such changes.

2D. Agronomy and Horticulture

COM-74-10523/9GA PC$4.25/MF$1.45
Kentucky Univ., Lexington. Dept. of Agronomy.
SOIL TEMPERATURE CLIMATOLOGY OF KENTUCKY.
Progress rept.,
Jerry D. Hill, and Allen B. Elam, Jr. 1973, 25p NOAA-74020112
Pub. as Kentucky Agricultural Experiment Station, Lexington. Rept. no. PR-210.

Descriptors: *Farm crops, *Soil science, *Climatology, Temperature measurement, Corn plants, Soybean plants, Grain sorghum plants, Cotton plants, Tobacco plants, Vegetable crops, Depth, Freezing, Seasonal variations, Kentucky.
Identifiers: *Soil temperature, Agricultural meteorology.

Effects of soil temperatures on several plant species are discussed and information is given on temperatures normally measured in the soil at several locations in Kentucky. Following a discussion on soil factors influencing temperatures, the response of corn, soybeans, sorghum, cotton, tobacco, and vegetables crops to soil temperatures is explained. A comparison of soil temperatures at various planting depths is followed by data on the annual soil temperature cycle at selected locations. Data are also given on freezing of soils during the winter.

PB-228 792/8GA PC$7.25/MF$1.45
Nebraska State Dept. of Roads, Lincoln.
GERMINATION OF SEVEN SPECIES OF WILD FLOWERS AS AFFECTED BY DIFFERENT PREGERMINATION CONDITIONS.
Master's thesis,
Margaret C. Hesse, and S. S. Salac. Jul 73, 84p
Nebraska Study-64-2
Prepared by Nebraska Univ., Lincoln. Dept. of Horticulture and Forrestry.

Descriptors: *Flowers, *Germination, *Seeds, Stratification, Spring season, Cultivation, Storage, Light(Visible radiation), Temperature measurement, Viability, Theses.
Identifiers: *Wild flowers, Seed stratification.

Germination of seven species of wild flowers as affected by storage conditions, length of storage, and germination conditions was studied. On the basis of % germination/mean days to germination ratio, a storage treatment of stratification at C4 was the best for all the species tested, but the period ranged from 6 to 15 weeks depending on the species. A germinating conditions imulating late spring conditions gave the best ratios for seeds of rough gayfeather, cultivated thickspike gayfeather, grayhead prairie coneflower, upright prairie coneflower, butterfly milkweed, and black samson. Best ratios for seeds of uncultivated thickspike gayfeather and shell-leaf penstemon were obtained under 33C and 14 1/2 hours alternating with 19C and 9 1/2 light.

TT-71-56013/04 PC$4.75/MF$1.45
Department of Agriculture, Washington, D.C.
JOURNAL FOR SCIENTIFIC AGRICULTURAL RESEARCH. VOLUME 25, NUMBER 92, 1972.
1973, 130p
Trans. of Arhiv za Poljoprivredne Nauke i Tehniku (Yugoslavia) v25 n92 p3-148 1972, by Nada Kronja-Stanic. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Agricultural research, Agricultural planning, Grapes, Pest control, Soil properties, Forage legumes, Feeding stuffs, Beef cattle, Corn, Preserving, Oilseeds, Domestic animals, Urea, Swine, Livestock, Translations, Yugoslavia.
Identifiers: Corn cob meal, Sunflower oil meal.

Contents:
- Effects of grape rootstocks on certain biological and technological properties of Perlette Seedless Grape variety;
- Study of the Pink Bollworm under Southern Macedonian conditi ons;
- Catalytic power of the pseudogley of Western Serbia;
- Properties and problems of improvement of soils in the North Jegricka River Basin;
- Contribution to the study of certain properties of the Solonetz of the Banat Potisje;
- Utilization of rations with varying concentrate to alfalfa meal ratios in fattening young bulls;
- Effects of substituting corn-cob meal for ground corn and urea for sunflower oil meal in all-concentrate fattening of young bulls;
- Effect of gain rate on certain carcass traits of Large Whites;
- Effect of the physical form of feed on ration consumption and digestibility, rumen development and the growth of calves;
- Contribution to the study of propionic acid as a high-moisture corn kernel preservative.

TT-71-56098/02 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
PLANT PROTECTION. VOLUME 22, NUMBER 114, 1971.
1973, 81p
Trans. of Zastita Bilja (Yugoslavia) v22 n114 p159-246 1971, by Mihailo Markovic. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Plants(Botany), *Pest control, *Plant diseases, Beetles, Plant anatomy, Plant ecology, Fecundity, Berries, Rice plants, Worms, Plant pathology, Herbicides, Translations, Yugoslavia.

Contents:
- Stem nematode (Ditylenchus dipsaci) with reference to host plants in Serbia;
- Contribution to the study of natural enemies of the Ceral Leaf Beetle (Lema melanopa) in Yugoslavia;
- A study of the morphology and ecology of Phyllosticta prunicola;
- Influence of diet type on fecundity of life table of Acanthoscelides obtectus;
- Influence of temperature on the population growth of Acanthoscelides obtectus;
- Chemical control of Botrytis cinerea on strawberry;
- Rice stem borers in Burma--their incidence in the field;
- Mediterranean sage.

2E. Animal Husbandry

COM-74-10500/8GA Reprint
Maine Univ., Orono. Dept. of Animal and Veterinary Sciences.
DEHYDRATED SCALLOP VISCERA, A POTENTIAL COMPONENT OF POULTRY RATIONS,
D. L. Blamberg, and D. C. O'Meara. 4 Dec 72, 5p
Maine-Sea Grant-TR-2 NOAA-74013102
Contract NOAA-1-36099
Pub. in Poultry Science, v52 n3 p1203-1205 May 73.

Descriptors: *Feeding stuffs, *Poultry, *Shellfish, *Mollusca, Proteins, Amino acids, Lipids, Animal nutrition, Economic estimates, Poisons, Fishing products.
Identifiers: Sea Grant program, Scallop viscera.

Dehydrated scallop viscera was found to contain approximately 50% protein, 19% ash (including 9.7% salt) and 16% ether extract. The amino acid pattern of the final product tends to resemble that of other protein supplements commonly included in commercial poultry rations. Pending results of feeding trials and an economic evaluation, it would appear that dehydrated scallop viscera has potential value as an ingredient in poultry feeds. Researchers are alerted to the possibility of encountering a form of paralytic poison in shellfish. (Modified author abstract)

COM-74-10514/9GA PC$3.00/MF$1.45
Maine Univ., Orono. Life Sciences and Agriculture Experiment Station.
PRELIMINARY OBSERVATIONS CONCERNING THE NUTRITIVE VALUE OF DEHYDRATED SCALLOP VISCERA AS A COMPONENT OF POULTRY RATIONS.
Technical rept.,
D. L. Blamberg, D. C. O'Meara, R. W. Gerry, P. C. Harris, and T. A. Bryan. Mar 73, 18p Misc-129, Maine-Sea Grant-TR-3 NOAA-74013103

Descriptors: *Feeding stuffs, *Animal nutrition, *Mollusca, Shellfish, Poultry, Poisons, Enzymes, Proteins, Fishing products, Thiamine.
Identifiers: Sea Grant program, Scallop Viscera.

A series of experiments was conducted to obtain preliminary information relative to the nutritive value of dehydrated scallop viscera (DSV). Many of the chickens reported herein exhibited paralysis which was reminiscent of classical thiamine deficiency. Intramuscular injection of large doses of thiamine resulted in dramatic remission of neurologic symptoms. It was concluded that the temperature employed in processing DSV (while satisfactory from the standpoint of preserving lysine availability) was too low to inactivate thiaminase, an enzyme found in raw, unprocessed fish and shellfish. It is postulated that processing temperatures can be increased sufficiently to inactivate thiaminase while maintaining available lysine at a satisfactory level.

TT-72-51084 PC$3.00/MF$1.45
Agricultural Research Service, Washington, D.C.

DOES THE FEEDING OF SHEEP AFFECT THE QUALITY OF WOOL FAT (VLIYAET LI TIP KORMLENIYA OVETS NA KACHESTVO ZHIROPOTA),
A. N. Dubinin. 1973, 8p
Trans. of Ovtsevodstvo (USSR) n1 p31-33 1967. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Sheep, *Animal husbandry, *Animal nutrition, Wool, Diets, Feeding habits, USSR, Translations.

On the basis of the studies made, it can be concluded that with increase in the amount of corn silo in the ration of sheep the content of wool fat increases and the zone of washing of staple increases; feeding of sunflower oil cake instead of pea to sheep and also of fodder phosphatides increases the content of wool fat in wool and improves its quality. The wool fat becomes more resistant to washing and acquires mainly light-yellow (cream) color. On adding sunflower oil cake to the ration, the physico-chemical constants of wool fat increase.

TT-73-52011 PC$3.00/MF$1.45
Agricultural Research Service, Washington, D.C.
THE HORSE FLY AS A CARRIER OF ANAPLASMOSIS OF CATTLE IN UZBEKISTAN (SLEPNI KAK PERENOSCHIKI ANAPLAZMOZA KRUPNOGO ROGATOGO SKOTA V VZBEKISTANE),
M. K. Kadyrova, and S. A. Nadyrov. 1973, 9p
Technical trans. of Akademiya Nauk Uzbekskoi SSR, Tashkent. Doklady, v19 n8 p55-57 1962, by J. Honmode. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Diptera, *Cattle, *Anaplasma, *Parasitic diseases, Rickettsiales, Parasites, Disease vectors, Translations, USSR.
Identifiers: Tabanus leleani, Tabanus antunnalis brunnescens, Tabanus golovi pallidus, Tabanus laetitinctus, Horseflies, Anaplasmosis.

Since the ticks and mites did not appear to be carriers of anaplasmosis, in 1961 the authors decided to experimentally study horse flies as possible mechanical carriers of the anaplasma. Experiments were performed in three young bulls. Bull No. 1581 was given infected blood in February, developed anaplasmosis in April, and was splenectomized on May 12, 1961, prior to the experiment. Bull No. 12 was subjected to a similar treatment, and on May 16, anaplasma were observed in the smears of peripheral blood. Bull No. 19 served as a control during infection from the blood of bull No. 1581 for the determination of pathogenicity of anaplasma circulating in the blood of the splenectomized bull. Bull No. 19 was injected with 50 cc of blood and 19 days later developed anaplasmosis. The specific clinical features were anaplasma in the erythrocytes of peripheral blood, increase in body temperature, and considerable decrease in hemoglobin.

TT-73-52012 PC$3.00/MF$1.45
Agricultural Research Service, Washington, D.C.
THE NATURE OF THE PATHOLOGICAL PROCESS IN DEMODETIC MANGE OF CATTLE AND ITS EFFECT ON QUALITY OF THE HIDE TRADE (KHARAKTER PATHOLOGICHESKOGO PROTSESSA PRI DEMODEKOZA KRUPNOGO ROGATOGO SKOTA I VLIYANIE EGO NA KACHEST VO KOZHTOVARA),
M. V. Krotova. 1973, 16p
Technical trans. of Vsesoyuznyi Nauchno-Issledovatelskii Institut Veterinarnoi Sanitarii i Ektoparazitologii. Trudy (USSR) v12 p14-27 1957, by J. Honmode. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Skin diseases, *Parasitic diseases, *Cattle, Hides, Veterinary medicine, Mites, Parasites, Therapy, Prophylaxis, USSR, Translations.
Identifiers: Deomodex bovis.

Demodectic mange of cattle is one of the parasitic diseases inducing destruction of the living skin. This disease is quite widespread among cattle in the USSR, as well as abroad, and causes considerable economic loss to the animal husbandry and hide industries. Demodectic mange of cattle is caused by the microscopically small mite Demodex. For the successful discovery of curative and prophylactic measures, the biological peculiarities of the parasite and the ecological conditions of its parasitization should be known, as well as the nature of the pathological process. The sites of localization of demodectic nodules on the different anatomical areas of the body of each animal, the nature of the pathological process, its effect on the quality of hides, and the possibilities of medicinal application to the localized sites of mites were investigated.

2F. Forestry

E74-10306 PC$4.50/MF$1.45
Pacific Southwest Forest and Range Experiment Station, Berkeley, Calif.
INVENTORY OF FOREST AND RANGELAND AND DETECTION OF FOREST STRESS.
Progress rept. No. 3, 1 Jul-31 Dec 73,
Robert C. Heller, Robert C. Aldrich, Frederick P. Weber, and Richard S. Driscoll. 20 Jan 74, 28p NASA-CR-136788
Contract NASA Order S-70251-AG
Original contains color imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S.D. 57198.

Descriptors: Forest management, Timber inventory, Timber vigor, Rangelands, Colorado, California, Earth resources program, Photogrammetry, Signature analysis, Spectral signatures, Data processing.

The author has identified the following significant results. Disturbances in a forest environment that cause reductions in forest area, timber volume, and timber growth can be detected on ERTS-1 combined color composites. However, detection depends on comparing a conventional aerial photograph taken at some base year with an ERTS-1 image taken in some subsequent year. In a test made on the Atlanta site, 1:63,360 scale aerial photo index sheets made in 1966 were compared with ERTS-1 image 1264-15445 (April 1973). Five factors were found important to detection reliability: (1) the quality of the imagery; (2) the season of the imagery; (3) the size of the disturbed area; (4) the number of years since the disturbance; and (5) the type of cutting treatment. Of 209 disturbances verified on aerial photography, 165 (or approximately 80%) were detected on the ERTS-1 image by one independent interpreter. Improved training and additional experience in using this low resolution imagery should improve detection. Of the two seasons of data studies (fall and early spring), early spring is the best for detecting land use changes. Generally speaking, winter, early spring, and early summer are the best times of year for detecting forest disturbances.

E74-10318 PC$4.00/MF$1.45
Natural Resources Management Corp., Berkeley, Calif. Research and Development Div.
INVESTIGATION OF THE DETECTION AND MONITORING OF FOREST INSECT INFESTATIONS IN THE SIERRA NEVADA MOUNTAINS OF CALIFORNIA.
Progress rept. 1 Jun-30 Sep 73,
Ralph C. Hall. 30 Nov 73, 7p NASA-CR-136807
Contract NAS5-21770

Descriptors: Forests, Timber vigor, Insects, Infestation, Sierra Nevada Mountains(CA)., Earth resources program, Resources management, Lakes, Glaciers, Structural properties(Geology).

The author has identified the following significant results. In earlier reports it has been indicated that it is possible to delineate areas of lodgepole pine timber mortality into three degrees of damage from enlarged ERTS-1 color composites; light, medium, and heavy. It can also be confidently reported that is is now possible to detect all major areas of lodgepole pine defoliated by the needle miner. It has also been confirmed, through ground checking and helicopter observation that previous designation of the following features have been consistently accurate: timbered vs non-timbered areas; timber types; damaged vs undamaged areas; lakes, dome shadows which resemble lakes, mountain meadows, pasture and agricultural land, desert; riparian vegetation; and glaciers.

PAT-APPL-395 025 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
METHOD OF CHEMICALLY INDUCING LIGHTWOOD FORMATION IN PINE TREES.
Patent Application,
Donald R. Roberts, William J. Peters, Thaddeus A. Harrington, Junior Bromfield, and Ernest R. Crews. Filed 7 Sep 73, 13p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Pine trees, *Oleoresins, *Turpentine, Rosin.
Identifiers: PAT-CL-208-40.

The patent application describes an improved method of inducing lightwood formation (resin soaking) in pine trees resulting in increased deposition of naval stores products within the trees. Lightwood induction is accomplished by treating a small area on the tree with an aqueous chemical solution which moves through the wood causing the ray parenchyma and epithelial cells to release oleoresin from the resin ducts into the tracheids and stimulating increased oleoresin production. These oleoresins are extracted from the trees by known methods and the naval stores products are recovered therefrom.

PB-228 870/2GA PC$5.25/MF$1.45
New Mexico Univ., Albuquerque. Dept. of Biology.
THE RELATIONSHIP OF SOIL TEMPERATURE AND CYTOKININ PRODUCTION IN ASPEN INVASION.
Master's thesis,
Kristen R. Williams. May 72, 42p W74-04978, OWRR-A-039-NMEX(2)
May 72,

Descriptors: *Soil science, *Plant reproduction, *Forest trees, Plant hormones, Temperature measurement, Thermodynamic properties, Plant growth, Plant ecology, Plant physiology, Growth regulators, Soil water, Regression analysis, Theses.
Identifiers: *Populus tremuloides, Cytokinin, *Aspen invasion.

Quaking aspen (Populus tremuloides Michx.) primarily reproduce by suckering (i.e., root sprouting). Numerous environmental variables have been suggested as causes of this phenomenon, the most notable of which is soil temperature. Studies demonstrating thermal regulation of sprouting indicate the involvement of growth hormones. The only class of hormones to elicit a response similar to sprouting is the cytokinins. Other hormones, no doubt, function in this process as well (e.g., auxins). Regression analyses results indicated that in this subalpine meadow, 91.9% of the variation in soil moisture was accounted for by the silt percentage, and 66% of the variation in soil temperatures was accounted for by soil moisture.

PB-228 873/6GA PC$4.75/MF$1.45
New Mexico Univ., Albuquerque. Dept. of Biology.

ALTITUDINAL VARIATION OF CHLOROPHYLL CONCENTRATION AND REFLECTANCE OF THE BARK OF 'POPULUS TREMULOIDES.'
Master's thesis,
William W. Covington. May 72, 35p W74-04977, OWRR-A-039-NMEX(1)

Descriptors: *Plant ecology, *Forest trees, *Plant physiology, Mountains, Photosynthesis, Altitude, Plant tissues, Reflection, Chlorophylls, Sangre de Cristo Mountains, New Mexico, Theses.
Identifiers: *Populus tremuloides, Corticular photosynthesis.

Chlorophyll concentration and reflectance of bark samples of Populus tremuloides Michx. growing at various elevations in the Sangre de Cristo mountain range of New Mexico indicate that the appearance of greener barked trees at higher elevations is due to the reflectance characteristics of a bloom of dead periderm cells and not to increased chlorophyll concentrations. Chlorophyll concentrations in aspen bark were, in fact, inversely correlated with altitude.

PB-228 874/4GA PC$6.25/MF$1.45
New Mexico Univ., Albuquerque. Dept. of Biology.
SOME ASPECTS OF THE ROLE OF USNIC ACID IN FOREST ECOLOGY.
Master's thesis,
Yvonne C. Rogers. May 72, 62p W74-04979, OWRR-A-039-NMEX(3)

Descriptors: *Forest land, *Lichens, *Plant ecology, Germination, Soil microbiology, Microorganisms, Softwoods, Bacteria, Fungi, Seeds, Sangre de Cristo Mountain, New Mexico.
Identifiers: *Usnic acids, Usnea tillandsioides.

The objectives were to obtain a measure of the amount of Usnea that falls to the forest floor; to determine if there is any difference between usnic acid production in the summer and the fall; to determine if rainwater is an important factor in leaching usnic acid out of lichen material; and to examine the effects of usnic acid upon soil microorganisms and germinating coniferous seedlings.

3. ASTRONOMY AND ASTROPHYSICS

3A. Astronomy

AD-774 856/9GA PC$3.00/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
MOONRISE, MOONSET AND MOON PHASES FOR 1974 AT WHITE SANDS MISSILE RANGE INCLUDING DAILY DECLINATIONS AND PERCENT ILLUMINATED, AND TIMES OF ECLIPSES, EQUINOXES AND SOLSTICES, WITH CONDENSED TABLES OF SUNRISE-SUNSET TIMES AND BEGINNINGS AND ENDINGS OF TWILIGHT.
Meteorological data rept.,
George M. Fugate, and Lamar Newman. Dec 73, 25p Rept no. DR-806

Descriptors: *Moon, *Ephemerides, *Guided missile ranges, Lunar eclipses, Illumination, Lunar probes, Lunar environment, Meteorological data, Sunrise, Twilight, Periodic variations, Diurnal variations, Phase.
Identifiers: Moonset, White Sands Missile Range, Moonrise.

Contents: Times of moonrise, moonset and moon phases at WSMR in 1974; and, use of solar-lunar charts and declination tables.

JPRS-61147 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
DETERMINATION OF PERSONAL ERRORS IN OBSERVATIONS OF THE LARGE PLANETS,
G. M. Petrov, V. N. Pyshnenko, and R. T. Fedorova. 5 Feb 74, 11p
Trans. of Glavnaya Astronomicheskaya Observatoriya, Pulkovo. Izvestiya (USSR) n191 p107-111 1973.

Descriptors: *Astrometry, *Astronomical instruments, Planets, Observation, Error analysis, Correction, Translations, USSR.

The report describes an instrument for determining personal errors in the observation of the large planets. Allowance for the determined corrections made it possible to improve the agreement between the observed right ascensions of the planets and the data given in the ephemerides. (Author)

N74-15500/3GA PC$7.50/MF$1.45
Universidad Nacional de Colombia, Bogota. Facultad de Ciencias.
ANNUAL OF THE NATIONAL ASTRONOMICAL OBSERVATORY FOR 1973 ANUARIO DEL OBSERVATORIO ASTRONOMICO NACIONAL, 1973.
1973, 109p
Language in Spanish.

Descriptors: *Astronomical catalogs, *Ephemerides, Calendars, Eclipses, Planets, Stars, Sun, Tables (Data).

For abstract, see STAR 1206

3B. Astrophysics

AD-774 885/8GA PC$3.00/MF$1.45
California Univ Riverside Inst of Geophysics and Planetary Physics
THE RADIATION BELTS OF JUPITER.
Technical rept.,
Kent G. Stansberry, and R. Stephen White. Nov 73, 11p Rept nos. IGPP-UCR-73-53, TR-13
Contract N00014-69-A-0200-5004
Prepared in cooperation with Aerospace Corp., El Segundo, Calif. Pub. in Science, v182 p1020-1021 Dec 73.

Descriptors: *Jupiter(Planet), *Radiation belts, Electrons, Protons, Solar wind, Extraterrestrial radio waves.

Predictions of Jupiter's electron and proton radiation belts are based on the observed decimeter radiation coming from the vicinity of Jupiter and on the assumption that radial diffusion inward from the solar wind is the source of the radiation belts. (Author)

AD-774 918/7GA PC$5.00/MF$1.45
Stanford Univ Calif Inst for Plasma Research
A STUDY OF THE MEAN SOLAR MAGNETIC FIELD,
Philip H. Scherrer. Dec 73, 161p Rept no. SU-IPR-554
Contract N00014-67-A-0112-0068, Grant NSF-GA-31138
Sponsored in part by Grant NGR-05-020-0068.

Descriptors: *Sun, *Magnetic fields, Solar physics, Interplanetary space, Correlation techniques.
Identifiers: *Solar magnetic fields, Interplanetary magnetic field.

The magnetic field of the sun seen as a star has been observed at the Mount Wilson Observatory. The sun-as-a-star field, or mean field, as measured in integrated sunlight has been compared with both large scale averages of conventional solar magnetic maps and the interplanetary magnetic field observed near the earth. Three somewhat independent topics concerning the 'mean field' observations and interpretation are discussed: The relation between the mean field observations and models of large scale solar magnetic structure, the nature of the comparison of the mean field with the interplanetary field, and the relative contribution of fields on different parts of the solar disk to the mean field. The relationship between the observed large scale magnetic structure and models of the solar field is discussed in terms of the 'Babcock-Leighton' and 'sector' models. (Modified author abstract)

AD-775 086/2GA PC$6.00/MF$1.45
Massachusetts Inst of Tech Cambridge Dept of Mechanical Engineering
ORIGIN OF SURFACE FEATURES OF THE MOON,
E. Orowan. Jun 73, 60p AFOSR-TR-74-0179
Contract F44620-72-C-0066

Descriptors: *Moon, *Structural geology, Lunar topography.
Identifiers: *Lunar geology.

The usual lava-pool hypothesis of lunar tectonics seem incompatible with numerous features of the lunar surface, in addition to leaving other features unexplained. The lunar-body hypothesis, on the other hand, does not encounter similar difficulties and it provides simple explanations for many hitherto puzzling characteristics of the lunar surface. A simple calculation combining the Hertz theory of elastic contact with the Griffith biaxial theory of fracture explains the flatness of the crater floor, and the terraced wall; the polygonal shape of the identation craters and the tangential rays around them are inertia effects due to the near-sonic velocity of crack propagation. (Modified author abstract)

AD-775 215/7GA PC$4.00/MF$1.45
Stanford Univ Calif Inst for Plasma Research
THE RELATIONSHIP BETWEEN THE SLOWLY VARYING COMPONENT OF SOLAR RADIO EMISSION AND LARGE SCALE PHOTOSPHERIC MAGNETIC FIELD PATTERNS,
P. H. Scherrer, and M. El-Raey. Dec 73, 19p Rept no. SU-IPR-556
Contract N00014-67-A-0112-0068, Grant NGR-05-020-559
Sponsored in part by Grant NSF-GA-31138. Prepared in cooperation with California Univ., Berkeley. Space Sciences Lab.

Descriptors: *Solar radiation, Magnetic fields, Flux(Rate), Correlation techniques.
Identifiers: *Solar magnetic fields, Interplanetary magnetic fields, *Solar radio emission, Photosphere.

Daily solar radio flux observations have been examined for a relationship to the large-scale photospheric magnetic field structure. Interplanetary magnetic field sector boundaries were used to indicate boundaries between photospheric field regions of opposite polarity. An enhancement in emission was found about four days before the boundary central meridian passage. Most of the effect came from emission near toward-to-away type boundaries. A higher level of emission appears to be associated with toward field regions than with away field regions. (Author)

AD-775 216/5GA PC$5.00/MF$1.45
Stanford Univ Calif Inst for Plasma Research
A MODEL COMBINING THE POLAR AND THE SECTOR STRUCTURED SOLAR MAGNETIC FIELDS,
Leif Svalgaard, John M. Wilcox, and Thomas L. Duvall. Jan 74, 36p Rept no. SU-IPR-557
Contract N00014-67-A-0112-0068, Grant NGR-05-020-559
Sponsored in part by National Science Foundation, Grant NSF-GA-31138.

Descriptors: *Solar atmosphere, *Atmosphere models, Solar corona, Magnetic fields, Interplanetary space.

Identifiers: *Solar magnetic fields, Interplanetary magnetic fields.

A phenomenological model of the interplay between the polar magnetic fields of the sun and the solar sector structure is discussed. Current sheets separate regions of opposite polarity and mark the sector boundaries in the corona. The sheets are visible as helmet streamers. The solar sector boundary is tilted with respect to central meridian, and boundaries with opposite polarity change are oppositely tilted. The tilt of a given type of boundary ((+,-) or (-,+)) changes syatematically during the sunspot cycle as the polarity of the polar fields reverses. Similar reversals of the position of the streamers at the limbs takes place. Observational evidence in support of the model is presented, especially the findings of Hansen, Sawyer and Hansen and Koomen and Howard that the K-corona is highly structured and related to the solar sector structure. (Modified author abstract)

AD-775 557/2GA PC$3.00/MF$1.45
Stanford Univ Calif Inst for Plasma Research
GREEN CORONA AND SOLAR SECTOR STRUCTURE.
Technical rept.,
Ester Antonucci, and Leif Svalgaard. Feb 74, 17p
Rept no. SU-IPR-561
Contract N00014-67-A-0112-0068, Grant NGR-05-020-559
Sponsored in part by Grant NSF-GA-31138.

Descriptors: *Solar corona, *Solar structure, *Solar spectrum, Visible spectra, Green, Line spectra.

Analysis of the green line corona for the interval 1947-1970 suggests the existence of large-scale organization of the emission. The green line emission at high northern latitudes (about 40 degrees to 60 degrees) is correlated with the emission at high southern latitudes 6, 15 and 24 days later, while the low latitude green corona seems to be correlated on both sides of the equator with no time lag. These coronal features are recurrent with a 27 day period at all latitudes between plus or minus 60 degrees, and we associate these large-scale structures with the solar magnetic sector structure. The high correlation between northern and southern high-latitude emission at 15 days time lag is explained as a signature of a two-sector structure, while four sectors are associated with the 6 and 24 day peaks. (Author)

COM-74-50119/8GA Not available NTIS
National Bureau of Standards, Washington, D.C.
SUGGESTED INTERPRETATION OF THE CORRELATIONS IN INTENSITY FLUCTUATIONS IN THE LINES CA(II) H AND K, MAGNESIUM B, AND HYDROGEN HBETA.
Final rept.,
Richard N. Thomas. 1972, 2p
Pub. in Solar Physics, v27 p303-304 Dec 72.

Descriptors: *Solar spectrum, Calcium, Hydrogen, Potassium, Magnesium, Atomic spectra.

Evans and Catalano have found interesting behavior in the correlation between intensity fluctuations in the continuum and in the lines H and K of Ca II, b1 and b2 of MgI, and hydrogen Hbeta. In the first four lines, the correlation drops smoothly from about 0.9 near the continuum to negative values; followed by a rise to about zero at line center. For H, the correlation is never negative, reaching zero at about 0.25 A. In the report, the authors suggest that this behavior reflects a combination of effects. First the source-sink terms in the source- functions depend on different physical parameters in the two sets of lines. In addition, the line center regions are dominated by transfer effects at the top of the atmosphere.

N74-14897/4GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
MOTION OF METRIC TYPE 4 RADIO SOURCES AND ITS RELATION TO SHOCK WAVES RESPONSIBLE FOR TYPE 2 RADIO BURSTS.
K. Sakurai. Dec 73, 12p NASA-TM-X-70557, X-690-73-367

Descriptors: *Shock waves, *Type 2 bursts, *Type 4 bursts, *Velocity measurement, Data processing, Emission spectra, Radio sources (Astronomy).

For abstract, see STAR 1206

N74-14899/0GA PC$3.00/MF$1.45
Ceskoslovenska Akademie Ved, Ondrejov. Astronomical Inst.
SOLAR RADIO DATA, APRIL 1973.
Apr 73, 14p

Descriptors: *Electromagnetic noise, *Solar radio bursts, Czechoslovakia, Magnetic storms, Solar flares, Solar flux, Tables (Data).

For abstract, see STAR 1206

N74-14900/6GA PC$3.00/MF$1.45
Ceskoslovenska Akademie Ved, Ondrejov. Astronomical Inst.
SOLAR RADIO DATA, FEBRUARY - MARCH 1973.
Mar 73, 20p

Descriptors: *Electromagnetic noise, *Solar radio bursts, Czechoslovakia, Magnetic storms, Solar flares, Solar flux, Tables (Data).

For abstract, see STAR 1206

N74-14901/4GA PC$3.00/MF$1.45
Ceskoslovenska Akademie Ved, Ondrejov. Astronomical Inst.
SOLAR RADIO DATA, MAY 1973.
May 73, 12p

Descriptors: *Electromagnetic noise, *Solar radio bursts, Czechoslovakia, Magnetic storms, Solar flares, Solar flux, Tables (Data).

For abstract, see STAR 1206

N74-14902/2GA PC$3.00/MF$1.45
Ceskoslovenska Akademie Ved, Ondrejov. Astronomical Inst.
SOLAR RADIO DATA, JULY 1973.
Jul 73, 9p

Descriptors: *Electromagnetic noise, *Solar radio bursts, Czechoslovakia, Magnetic storms, Solar flares, Solar flux, Tables (Data).

For abstract, see STAR 1206

N74-14903/0GA PC$3.00/MF$1.45
Ceskoslovenska Akademie Ved, Ondrejov. Astronomical Inst.
SOLAR RADIO DATA, JUNE 1973.
Jun 73, 11p

Descriptors: *Electromagnetic noise, *Solar radio bursts, Czechoslovakia, Magnetic storms, Solar flares, Solar flux, Tables (Data).

For abstract, see STAR 1206

N74-14904/8GA PC$3.00/MF$1.45
Ceskoslovenska Akademie Ved, Ondrejov. Astronomical Inst.
SOLAR RADIO DATA, SEPTEMBER 1973.
Sep 73, 12p

Descriptors: *Electromagnetic noise, *Solar radio bursts, Czechoslovakia, Magnetic storms, Solar flares, Solar flux, Tables (Data).

For abstract, see STAR 1206

N74-14905/5GA PC$3.00/MF$1.45
Ceskoslovenska Akademie Ved, Ondrejov. Astronomical Inst.
SOLAR RADIO DATA, OCTOBER 1973.
Oct 73, 11p

Descriptors: *Electromagnetic noise, *Solar radio bursts, Czechoslovakia, Magnetic storms, Solar flares, Solar flux, Tables (Data).

For abstract, see STAR 1206

N74-15472/5GA PC$8.00/MF$1.45
Stanford Univ., Calif. Inst. for Plasma Research.
THERMALLY DRIVEN MASS FLOWS IN THE CONVECTION ZONE OF THE SUN.
G. C. Dijkhuis. May 73, 118p NASA-CR-136505, SU-IPR-518
Contract NGL-05-020-272

Descriptors: *Convection, *Fluid dynamics, *Mass flow, *Solar rotation, Convective flow, Solar radiation, Surface properties, Vorticity.

For abstract, see STAR 1206

N74-15473/3GA PC$3.50/MF$1.45
Observatorio Astronomico Municipal, Rosario (Argentina).
GENERAL CATALOG OF SUNSPOTS AND SUMMARY OF SOLAR ACTIVITY FOR 1972 CATALOGO GENERAL DE MANCHAS SOLARES Y RESUMEN DE ACTIVIDAD, 1972.
1972, 28p CONTRIB-7
In Spanish; English Summary.

Descriptors: *Astronomical catalogs, *Sunspots, Solar activity, Solar storms, Tables (Data).

For abstract, see STAR 1206

N74-15474/1GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
AN INTERPRETATION OF THE OBSERVED OXYGEN AND NITROGEN ENHANCEMENTS IN LOW ENERGY COSMIC RAYS.
L. A. Fisk, B. Kozlovsky, and R. Ramaty. Dec 73, 10p NASA-TM-X-70564, X-660-73-383
Subm-Submitted for Publication.

Descriptors: *Cosmic rays, *Nitrogen, *Oxygen, Interstellar matter, Ionization, Nucleons, Sun.

For abstract, see STAR 1206

N74-15475/8GA PC$3.00/MF$1.45
National Aeronautics and Space Admini.tration. Goddard Space Flight Center, Greenbelt, Md.
THE ANOMALOUS ABUNDANCE OF COSMIC RAY NITROGEN AND OXYGEN NUCLEI AT LOW ENERGIES.
F. B. Mcdonald, B. J. Teegarden, J. H. Trainor, and W. R. Webber. Dec 73, 15p NASA-TM-X-70566, X-660-73-392

Descriptors: *Cosmic rays, *Nitrogen, *Oxygen, Astronomical telescopes, Pioneer space probes.

For abstract, see STAR 1206

N74-15476/6GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
NEUTRON PROPAGATION AND 2.2 MEV GAMMA-RAY LINE PRODUCTION IN THE SOLAR ATMOSPHERE.
H. T. Wang, and R. Ramaty. Jan 74, 20p NASA-TM-X-70568, X-660-74-5

Contract NGR-21-002-316

Descriptors: *Gamma rays, *Line spectra, *Neutron scattering, *Solar atmosphere, Monte carlo method, Neutron sources.

For abstract, see STAR 1206

N74-15480/8GA PC$5.75/MF$1.45
Consiglio Nazionale delle Ricerche, Rome (Italy). Lab. di Ricerca e Tecnologia per lo Studio del Plasma nello Spazio.
A TECHNIQUE FOR THE STUDY OF SHORT TERM COSMIC RAY VARIATIONS. PART 1: THE ORIGIN OF SCATTER TECHNIQUE.
L. R. Barnden. Dec 71, 74p LPS-71-29
Subm-Sponsored in Part by a Commonwealth of Australia Postgraduate Award.

Descriptors: *Cosmic rays, *Ground stations, *Interplanetary magnetic fields, *Radiation counters, *Scattering coefficients, Density distribution, Diurnal variations, Flux density, Interplanetary space.

For abstract, see STAR 1206

N74-15481/6GA PC$4.50/MF$1.45
Consiglio Nazionale delle Ricerche, Rome (Italy). Lab. di Ricerca e Tecnologia per lo Studio del Plasma nello Spazio.
A TECHNIQUE FOR THE STUDY OF SHORT TERM COSMIC RAY VARIATIONS. PART 2: THE FORBUSH DECREASE.
L. R. Barnden. Dec 71, 50p LPS-71-30

Descriptors: *Cosmic rays, *Forbush decreases, *Interplanetary magnetic fields, Density (Number/volume), Diurnal variations, Remote sensors, Scattering coefficients, Solar wind.

For abstract, see STAR 1206

N74-15489/9GA PC$3.00/MF$1.45
Texas Univ., Austin.
STUDY OF OPTICAL PROPERTIES OF X-RAY SOURCES.
Final Report, 1 Jul. 1972 - 30 Jun. 1973.
P. A. Vandenbout. 30 Jun 73, 5p NASA-CR-136551
Contract NGR-44-012-209

Descriptors: *Optical properties, *X ray sources, Radio observation, Spectral emission, Spectrograms, Stars.

For abstract, see STAR 1206

N74-15490/7GA PC$3.00/MF$1.45
Northwestern State Univ., Natchitoches, La.
PHOTOGEOLOGIC MAPPING OF MERIDIANI SINUS REGION FROM MARINER 6 AND 7 IMAGERY.
Final Technical Report.
R. A. Dehon. 1973, 17p NASA-CR-136588
Contract NGR-19-013-002

Descriptors: *Mapping, *Mars probes, *Photogeology, *Spaceborne photography, Albedo, Craters, Fluid flow, Mars surface, Stratigraphy.

For abstract, see STAR 1206

TRITA-EPP-72-3 PC$4.75/MF$1.45
Kungliga Tekniska Hoegskolan, Stockholm (Sweden). Institutionen Foer Plasmafysik.
LOCAL-HYDROGEN AND THE BACKGROUND LYMAN ALPHA PATTERN AND INTERACTION BETWEEN THE INTERSTELLAR MEDIUM AND SOLAR WIND PLASMA.
M. Wallis. Jun 72, 52p
U.S. Sales Only.

Descriptors: (*Solar wind, Interstellar space), (*Interstellar space, *Background radiation), Cosmic gases, Lyman lines, Plasma, Solar cycle.

For abstract, see NSA 29 05, number 11025.

3C. Celestial Mechanics

N74-15586/0GA PC$11.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE EARLY HISTORY OF THE LUNAR INCLINATION.
D. P. Rubincam. Dec 73, 178p NASA-TM-X-70554, X-592-73-328

Descriptors: *Earth-moon system, *Equators, *Lunar evolution, *Lunar tides, *Tides, Inclination, Viscous fluids.

For abstract, see STAR 1206

4. ATMOSPHERIC SCIENCES

4A. Atmospheric Physics

AD-774 883/1GA PC$4.25/MF$1.45
Army Electronics Command Fort Monmouth N J
AN ANALYSIS OF RANDOM FLUCTUATIONS OF ATMOSPHERIC DUST CONCENTRATIONS.
Research and development technical rept.,
David C. Henley. Jan 74, 21p Rept no. ECOM-5530

Descriptors: *Atmospheres, *Dust, Concentration(Composition), Time series analysis, Statistical analysis.

A modified structure function analysis is developed for and applied to time series data on the number concentration of atmospheric dust particles. Preliminary indications are that this application is a useful method of analysis. Systematic relationships of events manifested by the data are emphasized in a way which is potentially useful for the investigation of the causes of such relationships. (Author)

AD-774 917/9GA PC$3.00/MF$1.45
Office of Naval Research London (England)
WAVE INTERACTION IN THE LOWER IONOSPHERE - A SURVEY,
Arthur H. Waynick. 4 Dec 73, 16p Rept no. ONRL-R-30-73

Descriptors: *Ionosphere, *Radio waves, *Ionospheric propagation, Interactions, Luxemburg effect, Great Britain.
Identifiers: D region, Ionospheric modification.

A summarization of the reviews to date on the field of wave interaction in the lower ionosphere is attempted. This covers the study of the interaction process and the determination of electron density, N, and electron-neutral collisional frequency, nu, height distributions in D-region. The current status of the use of this technique in synoptic profile procurement and the role of this work in investigations on the physics and chemistry of this region are outlined. (Author)

AD-774 966/6GA PC$5.00/MF$1.45
Raven Industries Inc Sioux Falls S Dak Flight Operations Dept
SKYHOOK CHURCHILL 1973.
Interim rept. Jan-Dec 73,
Tom Pappas, and Paul S. White. 18 Jan 74, 117p
Rept no. R-0174002
Contract N00014-73-C-0456
See also AD-732 483.

Descriptors: *Atmospheric sounding, *Stratosphere, *Meteorological balloons, Balloon equipment, Launching, Tracking, Telemeter systems, Control systems, Flight testing.
Identifiers: SKYHOOK program, Fort Churchill(Manitoba).

The program was funded to conduct balloon field operations from Fort Churchill, Manitoba and from Thompson, Manitoba, Canada. The contract also called for the delivery of three balloons to be used in the program. Raven provided a field crew, suspension and rigging hardware, aircraft and helicopter tracking, parachutes, balloon telemetry and control instrumentation, electronic tracking, and reports and documentation as necessary. This report describes individual flights, equipment used, flight data, and various program information. (Author)

AD-775 006/0GA PC$5.25/MF$1.45
TRW Systems Group Redondo Beach Calif
CHARACTERISTICS OF MAGNETOSPHERIC SUBSTORMS AND THEIR EFFECTS UPON SPACECRAFT: A SELECTED BIBLIOGRAPHY,
W. R. Le Jeune, and L. R. Magnolia. Oct 73, 45p

Descriptors: *Magnetosphere, *Magnetic storms, *Synchronous satellites, *Bibliographies, Space environments, Charged particles, Radiation effects, Atmospheric electricity.

During the past 15 years many different NASA-launched satellites in earth orbit and deep space have collected an enormous amount of data which has been used to develop detailed models of the earth's magnetic field and plasma environment. Several of the spacecraft in the outer magnetosphere have experienced anomalous behavior and sometimes failures which, in most cases, were unexplained. Recently, some of these unwanted space events have been correlated with magnetospheric substorms. In an effort to shed more light on this problem and to facilitate research in this area the authors have prepared this bibliography. It is divided into two parts: Characteristics of magnetospheric substorms, and effects upon spacecraft. This material provides scientists and engineers a present day description of the substorm environment and consequences upon synchronous satellites. The space environment articles were limited to post- 1967 papers to provide the latest information on the fast developing definition of magnetospheric substorm phenomena.

AD-775 076/3GA PC$15.00/MF$1.45
Northeastern Univ Boston Mass
CERTAIN FINITE DIFFERENCE METHODS FOR THE SOLUTION OF LARGE SCALE CIRCULATION PROBLEM II.
Final rept. 1 Dec 71-30 Jun 73,
Robert D. Klein, Jack C. Mettauer, Vito P. Maglione, and Stanley L. Spiegel. 8 Nov 73, 238p
AFCRL-TR-73-0640
Contract F19628-72-C-0009

Descriptors: *Atmospheric circulation, *Equations of motion, *Finite difference theory, Numerical integration, Computer programs, FORTRAN.
Identifiers: CDC 6600 computers.

A program description for a large scale multi-level general circulation model of the atmosphere is presented. Several time integration scheme algorithms are discussed, and a linear stability analysis of finite difference approximation to a meteorological equation of motion is given. In addition, experiments involving the numerical solution of the non-divergent barotropic general circulation problem, using overlapping grid systems, are described and evaluated. Problems involving the numerical solution, via relaxation, of Poisson's equation on the sphere, and the evaluation of finite difference derivations of interpolated quantities are discussed. (Author)

AD-775 080/5GA PC$5.00/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
A FORTRAN PROGRAM FOR COMPUTING STEADY-STATE COMPOSITION MODELS OF THE UPPER ATMOSPHERE.
Air Force surveys in geophysics,

J. M. Forbes, and A. S. Bramson. 9 Oct 73, 36p
Rept nos. AFCRL-73-0635, AFCRL-AFSIG-276

Descriptors: *Upper atmosphere, *Atmosphere models, *Computer programs, Composition(Property), Nitrogen, Oxygen, Argon, Helium, Hydrogen, Dissociation, Steady state, FORTRAN.
Identifiers: *Atmospheric composition.

The report describes a method for computing steady-state composition models of the earth's thermosphere, including a FORTRAN program and usage guide. It originated in connection with work being performed for the Committee on the Extension of the U.S. Standard Atmosphere (COESA). The program computes profiles from 120 to 500 km of N2, O2, O, Ar, He, H, and H2, including the effects of vertical flow of the minor escaping species (He and H), and the production of H by chemical dissociation of H2 in the lower thermosphere. (Author)

AD-775 084/7GA PC$4.50/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
DETAILED SPECIFICATION OF THE ARCTIC IONOSPHERE AND AN APPLICATION TO THREE-DIMENSIONAL RAYTRACING.
Air Force surveys in geophysics,
J. Buchau, C. P. Pike, and M. Wong. 27 Nov 73, 30p Rept nos. AFCRL-73-0726, AFCRL-SFSIG-279

Descriptors: *Ionosphere, *Arctic regions, Atmosphere models, Aurorae, Electron density, Statistical analysis, Ionospheric propagation, Ray tracing.
Identifiers: F region.

A statistical analysis of Alouette topside ionograms shows that the probability of occurrence of the midlatitude F-layer trough is 100 percent in winter and at equinox, and is 50 percent in summer. The trough, which is generally centered on 55 degrees corrected geomagnetic latitude and which is about 5 degrees to 10 degrees wide, extends throughout the night hemisphere with f(o)F2 values less than 2 MHz. Comparison of the location of the trough to the area in which coverage by an over the horizon backscatter (OTHB) system is anticipated shows that the trough will adversely affect system performance in the northeast direction most of the night. An in-depth case study of the effects of the trough on HF propagation was made, based on an instantaneous three-dimensional description of the ionosphere. This description of the ionosphere was composed of cross sections showing ionospheric electron-density structure in the area northeast of the Polar Fox II site. Three-dimensional raytracing was applied to this description of the ionosphere, and the trough and the steep electron-density gradient at the poleward edge of the trough were found to adversely affect propagation of HF signals. (Modified author abstract)

AD-775 088/8GA PC$5.75/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
ELECTRON TRANSPORT IN A DILUTE WEAKLY IONIZED GAS APPLICATION TO A MODEL IONOSPHERE.
Environmental research papers,
John R. Jasperse. 27 Sep 73, 53p Rept nos. AFCRL-TR-73-0600, AFCRL-ERP-456

Descriptors: *Ionosphere, *Atmosphere models, Ionized gases, Electron transport, Atmospheric chemistry.

The author presents a kinetic model for the electron distribution function in micro-space in a dilute, nonuniform, weakly ionized gas. The model includes photoproduction of electron-ion pairs, electron-ion recombination, and elastic, inelastic, and ionizing electron-neutral collisions. Under special conditions exact solutions are found for the steady-state electron velocity spectrum in a uniform, infinite medium for a delta-function photon energy source, and for an exponentially decreasing photon energy source. Also presented is a general method for finding the electron distribution function in a plane-parallel medium where the neutral gas density varies exponentially with position. The method is applied to give an approximation to the electron-ion concentration, the electron-ion drift velocity, and the electron temperature for a model ionosphere at altitudes where the assumption of weak ionization is valid. (Author)

AD-775 168/8GA PC$3.25/MF$1.45
Aerospace Corp El Segundo Calif Lab Operations
GEOMAGNETICALLY TRAPPED ALPHA PARTICLES. LOW-ALTITUDE OUTER-ZONE ALPHA-PROTON COMPARISONS.
Rept. for Nov 72-Apr 73,
Joseph F. Fennell, J. Bernard Blake, and George A. Paulikas. 15 Jan 74, 40p Rept no. TR-0074(4260-20)-8 SAMSO-TR-74-24
Contract F04701-73-C-0074

Descriptors: *Van Allen radiation belt, *Alpha particles, *Protons, Distribution, Energy, Spectra.
Identifiers: OV1-19 satellite.

The outer-zone population of trapped alpha particles and protons was measured off the equator (B/Bo = 1.3-2.3) in the L interval 2 = or < L = or < 4 during 1969. The alpha-particle spectra are best represented by a power law with spectral indices between 2.4 and 4.0 over the energy range 0.85 = or < (E sub alpha) = or < 9.0 MeV. The alpha-particle and proton spectra have the same slope at the same total energy. The distribution functions for alpha particles and protons have similar shapes and they suggest that the location of the source of these particles is at L > 4. The proton pitch-angle distribution at small pitch angles is flatter than near the equator. It is suggested that pitch-angle scattering may be the primary source of the low-altitude ions. The measurements are compared with recent theoretical predictions. (Modified author abstract)

AD-775 207/4GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
GEOMAGNETIC ACTIVITY IN THE VICINITY OF SECTOR BOUNDARIES,
Ralph Shapiro. 12 Oct 73, 5p Rept no. AFCRL-TR-74-0069
Revision of report dated 24 Aug 73.
Availability: Pub. in Jnl. of Geophysical research, v79 n1 p289-291, 1 Jan 74.

Descriptors: *Magnetic storms, *Geomagnetism, Solar activity, Polarity.
Identifiers: Interplanetary magnetic fields.

The pattern of behavior of the average value of Kp in association with the interplanetary magnetic sector structure is discussed.

AD-775 260/3GA PC$3.25/MF$1.45
Avco Everett Research Lab Inc Everett Mass
LASER ATMOSPHERIC PROPAGATION KINETICS.
Semi-annual technical rept.,
C. A. Brau. Jan 74, 32p
Contract N00014-73-C-0311, ARPA Order-1806

Descriptors: *Laser beams, *Atmospheres, *Absorption(Physical), Infrared radiation, Molecular spectroscopy, Nitrogen oxides, Methane, Water, Carbon dioxide, Kinetics.
Identifiers: Deuterium fluoride lasers, *Atmospheric attenuation.

An analytical model has been developed describing the atmospheric absorption of DF laser energy and the subsequent kinetic processes of energy exchange. For eight representative strong laser transitions, the atmospheric absorbers with energy levels and absorption cross sections have been specified. The analytical kinetic model describing the kinetics of absorption by N2O, CO2, CH4, and HDO -H2O has been developed and rate constants have been selected for use in the calculation. Preliminary results of the quantitative determination of the atmospheric temperature change resulting from absorption by N2O are presented. An assessment of the sea level kinetic effects of N2O in heating the atmosphere is given using a simple square wave pulse shape. Two limiting concentrations of water have been used and the laser energy has been varied over several orders of magnitude. (Author)

AD-775 272/8GA Reprint
Texas Univ Dallas
EQUATORWARD SHIFT OF THE CLEFT DURING MAGNETOSPHERIC SUBSTORMS AS OBSERVED BY ISIS I,
J. D. Winningham, W. J. Heikkila, F. Yasuhara, and S. I. Akasofu. 16 Aug 73, 6p AFCRL-TR-74-0047
Contracts F19628-72-C-0230, NAS5-9112
Prepared in cooperation with Alaska Univ., College. Geophysical Inst., Grant NSF-GA-28101.
Revision of report dated 12 Feb 73.
Availability: Pub. in Jnl. of Geophysical Research, v78 n31 p7286-7291.

Descriptors: *Magnetosphere, *Magnetic storms, Motion, Scientific satellites.
Identifiers: ISIS I satellite.

Isis 1 satellite observations of the cleft position during magnetospheric substorms show that the cleft shifts equatorward as the interplanetary B(z) component turns southward and substorm activity increases and that it shifts back toward higher latitudes as substorm activity subsides and B(z) returns northward. Also, unusually low latitudes for the cleft (less than 70 degrees invariant latitude) were found during geomagnetic storms with significant Dst values and large negative B(z) values. Significant shifts occur in the cleft location with no accompanying effect seen in the AE index; however, B(z) is observed to be southward during these periods. (Author)

AD-775 317/1GA PC$3.25/MF$1.45
Stanford Research Inst Menlo Park Calif
BASIC ELECTRICAL PARAMETERS OF THE ATMOSPHERE.
Final rept.,
E. T. Pierce. Jan 74, 26p Rept no. SRI-4454-FR
Contract N00014-71-C-0106

Descriptors: *Atmospheric electricity, Lightning, Atmospherics, Noise(Radio), Thunderstorms, Hazards.

The report summarizes all the work accomplished since 1 March 1963 under Contract N00014-71-C-0106 and its predecessor, Contract Nonr-4099(00). The main achievements of the research have already been published in a series of 20 Scientific Notes; these notes--with their abstracts, where available--are listed. Investigations that have not been covered in a Scientific Note are cataloged and briefly described. Finally some comments are offered as to the probable future relevance to the mission of the U.S. Navy of research in atmospheric electricity. (Author)

AD-775 340/3GA PC$4.00/MF$1.45
New Mexico Inst of Mining and Technology Socorro
AUGMENTED RESEARCH AND GRADUATE EDUCATION IN THE ENVIRONMENTAL SCIENCES.
Final technical rept. 1 Sep 67-31 Aug 73,
M. Brook, S. A. Colgate, C. R. Holmes, W. Hume, and J. D. Klett. 31 Aug 73, 90p
Contract N00014-68-A-0157

Descriptors: *Atmospheric physics, *Cosmic rays, Scientific research, Universities, New Mexico.

Identifiers: Themis project.

The final report contains a general review of the six year operation including the names of graduate research assistants who earned advanced degrees, with abstracts of doctoral dissertations in an appendix; a listing for the six-year period of papers presented at meetings, journal papers published, and other publications; and research reports. Titles of the research reports are the following: Noise radar; Theoretical studies of ion populations in clouds; Calculations of electrical effects at the boundaries of electrically charged clouds; Atmospheric pressure studies; Radon studies; Cosmic ray experiment (detection of coincident EM and optical signals from extensive air showers). (Modified author abstract)

AD-775 504/4GA Reprint
Army Electronics Command Fort Monmouth N J
THE TOPSIDE IONOSPHERE AT MID-LATITUDES DURING LOCAL SUNRISE,
Haim Soicher. 28 Sep 72, 13p
Revision of report dated 17 Jul 72.
Availability: Pub. in Jnl. of Atmospheric and Terrestrial Physics, v35 p657-668 1973.

Descriptors: *Ionosphere, Sunrise, Electron density, Distribution, Scientific satellites.
Identifiers: *Topside ionosphere, Alouette 1 satellite.

Electron-density and scale height distributions obtained from more than 1000 Alouette I ionograms have been used to study the structure and variations of the mid-latitude topside ionosphere during the sunrise period from 21 May to 4 July 1963. With the assumption that the ionosphere is in a state of diffusive equilibrium, the scale heights are interpreted in terms of combined electron and ion temperature distributions and relative ion concentrations. (Modified author abstract)

AD-775 542/4GA Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
SUNRISE EFFECTS ON THE LATITUDINAL VARIATIONS OF TOPSIDE IONOSPHERIC DENSITIES AND SCALE HEIGHTS,
Haim Soicher. 24 Jul 72, 3p
Availability: Pub. in Nature Physical Science, v239 n93 p93-95, 9 Oct 72.

Descriptors: *Ionosphere, *Electron density, Sunrise, Scientific satellites.
Identifiers: *Topside ionosphere, Alouette 1 satellite.

Ionospheric sunrise represents the transition period between quasi-equilibrium conditions attained during the night and those attained during the day. The arrival of sunrise is manifested by a rapid increase in electron temperatures and a less rapid increase in ion temperatures at all altitudes. The raw data used were ionograms obtained by the Alouette I topside sounder as the satellite traversed above regions near and over the North American continent experiencing local sunrise at ionosphere heights. The two parameters presented are the electron density, at fixed topside altitudes, and the scale height.

AD-775 556/4GA PC$3.75/MF$1.45
Stanford Univ Calif Inst for Plasma Research
GEOMAGNETIC RESPONSES TO THE SOLAR WIND AND TO SOLAR ACTIVITY,
Leif Svalgaard. 8 Nov 73, 73p Rept no. SU-IPR-555
Contract N00014-67-A-0112-0068, Grant NGR-05-020-559
Sponsored in part by Grant NSF-GA-31138.

Descriptors: *Geomagnetism, *Solar disturbances, *Magnetosphere, Solar wind, Magnetic storms, Electric fields, Aurorae.

The paper presents a unified overview of present knowledge of the geomagnetic response to the dynamic solar wind. Physical understanding rather than observational details is emphasized. Following some historical notes, the formation of the magnetosphere and the magnetospheric tail is discussed. The importance of electric fields is stressed and the magnetospheric convection of plasma and 'frozen-in' magnetic field lines under the influence of large-scale magnetospheric electric fields is outlined. Ionospheric electric fields and currents are intimately related to electric fields and currents in the magnetosphere and the strong coupling between the two regions is discussed. The energy input of the solar wind to the magnetosphere and upper atmosphere is discussed in terms of the reconnection model where interplanetary magnetic field lines merge or connect with the terrestrial field on the sunward side of the magnetosphere. (Modified author abstract)

N74-15052/5GA PC$3.00/MF$1.45
Physical Research Lab., Ahmedabad (India).
MOLECULAR OXYGEN CONCENTRATIONS AT EQUATORIAL LATITUDES DERIVED FROM SOLAR ULTRA VIOLET ABSORPTION MEASUREMENTS.
B. H. Subbaraya, S. Prakash, V. Kumar, and P. N. Pareek. 1973, 5p AER-73-06
Subm-Submitted for Publication.

Descriptors: *India, *Nike-apache rocket vehicle, *Oxygen, Lithium fluorides, Lyman alpha radiation, Nitric oxide, Ultraviolet absorption.

For abstract, see STAR 1206

N74-15053/3GA PC$3.00/MF$1.45
Physical Research Lab., Ahmedabad (India).
MEASUREMENTS OF ELECTRON TEMPERATURES IN THE LOWER IONOSPHERE BY DETECTING THE SPACE POTENTIAL ON THE LANGMUIR PROBE CHARACTERISTIC.
B. H. Subbaraya, S. Prakash, S. P. Gupta, and H. S. S. Sinha. 1973, 5p AER-73-07

Descriptors: *Electron energy, *Electrostatic probes, *Potential energy, Alternating current, Ionosphere, Nike-apache rocket vehicle, Tellurium.

For abstract, see STAR 1206

N74-15064/0GA PC$3.75/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
MAGNETOSPHERIC ELECTRIC FIELD MEASUREMENTS DURING SUDDEN COMMENCEMENTS.
T. L. Aggson, and T. L. Skillman. Jul 73, 35p NASA-TM-X-70545, X-645-73-211
Subm-Submitted for Publication.

Descriptors: *Electric fields, *Explorer 43 satellite, *Magnetosphere, *Sudden ionospheric disturbances, Magnetic fields, Satellite-borne instruments.

For abstract, see STAR 1206

N74-15066/5GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ON THE SOURCE OF FLARE-EJECTA RESPONSIBLE FOR GEOMAGNETIC STORMS.
K. Sakurai. Jan 74, 12p NASA-TM-X-70567, X-693-74-1

Descriptors: *Magnetic storms, *Solar flares, *Type 2 bursts, *Type 4 bursts, Interplanetary space, Shock waves.

For abstract, see STAR 1206

N74-15067/3GA PC$4.75/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
AN AURORAL BREAKUP MECHANISM.
J. E. Maggs. Sep 73, 54p NASA-TM-X-70553, X-641-73-265
Subm-Submitted for Publication.

Descriptors: *Electron energy, *Electron precipitation, *Electrostatics, *Temperature gradients, Auroras, Electric fields, Whistlers.

For abstract, see STAR 1206

N74-15079/8GA PC$3.25/MF$1.45
Stockholm Univ. (Sweden). Inst. of Meteorology.
PHOTOCHEMICAL REACTIONS INITIATED BY AND INFLUENCING OZONE IN THE TROPOSPHERE.
P. Crutzen. May 73, 24p AP-13

Descriptors: *Atmospheric chemistry, *Ozone, *Photochemical reactions, *Troposphere, Atmospheric composition, Carbon monoxide, Methane, Nitric acid, Sunlight, Ultraviolet radiation.

For abstract, see STAR 1206

N74-15080/6GA PC$5.25/MF$1.45
Kiruna Geophysical Observatory (Sweden).
KIRUNA GEOPHYSICAL DATA. DATA SUMMARY 73/4-6, APRIL - JUNE 1973.
G. Gustafsson. Jun 73, 65p
Subm-Prepared Jointly with European Space Sounding Rocket Range.

Descriptors: *Auroras, *Cosmic rays, *Geophysical observatories, *Ionospheric propagation, *Magnetic signatures, Cosmic noise, Diurnal variations, Geomagnetism, Ionospheric sounding, Riometers, Sweden.

For abstract, see STAR 1206

N74-15099/6GA PC$4.25/MF$1.45
ITT Aerospace/Optical Div., Fort Wayne, Ind.
HIGH RESOLUTION INFRARED RADIATION SOUNDER FOR THE NIMBUS F SPACECRAFT.
Quarterly Report, Apr. - Jun. 1973.
E. W. Koenig. Sep 73, 42p NASA-CR-132899
Contract NAS5-21651
Misc-Revised.

Descriptors: *Infrared radiation, *Ionospheric sounding, *Nimbus 6 satellite, Amplifiers, Satellite-borne instruments, Systems engineering.

For abstract, see STAR 1206

4B. Meteorology

AD-774 787/6GA PC$7.25/MF$1.45
Army Electronics Command Fort Monmouth N J
THE HUNTER LIGGETT MILITARY RESERVATION, JOLON, CALIFORNIA, CLIMATE REPORT - 1964-1970.
Technical rept.,
James C. Devine, Winsor H. Aylesworth, Townsend E. Saunders, Kenneth M. Hardy, and Stewart C. Hoch. Dec 73, 319p Rept no. ECOM-6058

Descriptors: *Meteorological data, *Military facilities, Atmospheric temperature, Wind, Humidity, Precipitation, Trafficability, Barometric pressure, Density, Altitude, Fog, Visibility, Aviation safety, Cloud cover, Snow, Rain, California.
Identifiers: *Hunter Liggett Military Reservation, Jolon(California).

The report contains, in calendar form, the following data for the Hunter Liggett Military Reservation: Mean daily maximum and minimum temperatures; extremes of daily maximum and minimum temperatures; monthly averages of temperature,

wind speed and direction, precipitation, relative humidity, and prevailing wind directions; monthly record maximums of precipitation; and twenty-four hour (daily) record maximum of rain and snow. This calendar portion contains data from 1963 (only partially available through 1972. The remainder of this report deals with 1964 through 1970 only. (Modified author abstract)

AD-774 855/1GA PC$3.25/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
12808 LANCE MISSILE NO. 2205, ROUND NO. 208 APT (31 JANUARY 1974).
Meteorological data rept.
Jan 74, 30p Rept no. DR-814

Descriptors: *Meteorological data, *Sounding rockets, *Upper atmosphere, *Impact prediction, Atmospheric motion, Surface to surface missiles, Guided missile ranges, Atmospheric temperature, Barometric pressure, Exterior ballistics, Cloud cover, Humidity, Density, Tables(Data), New Mexico.
Identifiers: Lance missiles, Missile modification.

Meteorological data gathered for the launching of 12808 Lance, Missile Number 2205, Round Number 208 APT, are presented in tabular form. (Author)

AD-774 862/7GA PC$3.00/MF$1.45
Air Weather Service Scott AFB Ill
WEATHER WARNINGS.
1 Mar 74, 5p Rept no. AWS-Manual-105-8-Vol-3
Supersedes report dated 15 May 72, AD-741 872.

Descriptors: *Weather forecasting, *Pacific Ocean, Tropical cyclones, Military facilities, Radar tracking, Hurricane tracking, Storms, Typhoons.

The volume states policy, outlines responsibilities, and prescribes procedures for weather warning and specialized forecast support within the 1st Weather Wing area of responsibility.

AD-774 868/4GA PC$3.00/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Office
16101 LITTLE JOHN MISSILE NO. 3136, ROUND NO. 704 RM (28 NOVEMBER 1973).
Meteorological data rept.
Nov 73, 17p Rept no. DR-807

Descriptors: *Meteorological data, *Upper atmosphere, *Artillery rockets, *Impact prediction, Guided missile ranges, Atmospheric temperature, Barometric pressure, Atmospheric motion, Exterior ballistics, Cloud cover, Humidity, Density, Tables(Data), New Mexico.
Identifiers: Little John.

Meteorological data gathered for the launching of 16101 Little John, Missile Number 3136, Round Number 704 RM, are presented in tabular form. (Author)

AD-774 869/2GA PC$3.00/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Office
03702 HONEST JOHN MISSILE NO. 1785, ROUND NO. 639 AML (11 DECEMBER 1973).
Meteorological data rept.
Dec 73, 17p Rept no. DR-809

Descriptors: *Meteorological data, *Upper atmosphere, *Artillery rockets, *Impact prediction, Guided missile ranges, Atmospheric temperature, Barometric pressure, Atmospheric motion, Exterior ballistics, Cloud cover, Humidity, Density, Tables(Data), New Mexico.
Identifiers: Honest John.

Meteorological data gathered for the launching of 03702 Honest John, Missile Number 1785, Round Number 639 AML, are presented in tabular form. (Author)

AD-774 870/0GA PC$3.75/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Office
11602 LANCE MISSILE NO. 2527, ROUND NO. 204 RCT (13 DECEMBER 1973).
Dec 73, 51p Rept no. DR-810

Descriptors: *Meteorological data, *Upper atmosphere, *Sounding rockets, *Impact prediction, Surface to surface missiles, Guided missile ranges, Atmospheric temperature, Barometric pressure, Atmospheric motion, Exterior ballistics, Cloud cover, Humidity, Density, Tables(Data), New Mexico.
Identifiers: Lance missiles, Missile modification.

Meteorological data gathered for the launching of 11602 Lance, Missile Number 2527, Round Number 204 RCT, are presented in tabular form. (Author)

AD-774 871/8GA PC$3.00/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Office
16201 LITTLE JOHN MISSILE NO. 3154, ROUND NO. 705 RM (22 JANUARY 1974).
Meteorological data rept.
Jan 74, 15p Rept no. DR-811

Descriptors: *Meteorological data, *Upper atmosphere, *Artillery rockets, *Impact prediction, Guided missile ranges, Atmospheric temperature, Barometric pressure, Atmospheric motion, Exterior ballistics, Cloud cover, Humidity, Density, Tables(Data), New Mexico.
Identifiers: Little John.

Meteorological data gathered for the launching of 16201 Little John, Missile Number 3154, Round Number 705 RM, are presented in tabular form. (Author)

AD-774 872/6GA PC$3.25/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Office
14804 LANCE MISSILE NOS. 2201/2208 ROUND NOS. 205 APT/206 APT (24 JANUARY 1974).
Meteorological data rept.
Jan 74, 48p Rept no. DR-812

Descriptors: *Meteorological data, *Upper atmosphere, *Sounding rockets, *Impact prediction, Surface to surface missiles, Guided missile ranges, Atmospheric temperature, Barometric pressure, Atmospheric motion, Dew Point, Exterior ballistics, Cloud cover, Humidity, Density, Tables(Data), New Mexico.
Identifiers: Lance missiles, Missile modification.

Meteorological data gathered for the launching of 14804 Lance, Missile Numbers 2201/2208, ROUND Numbers 205 APT/206 APT, are presented in tabular form. (Author)

AD-774 875/9GA PC$3.00/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Office
16201 LITTLE JOHN MISSILE NO. 3159, ROUND NO. 706 RM (5 FEBRUARY 1974).
Meteorological data rept.
Feb 74, 17p Rept no. DR-815

Descriptors: *Meteorological data, *Upper atmosphere, *Artillery rockets, *Impact prediction, Guided missile ranges, Atmospheric temperature, Barometric pressure, Atmospheric motion, Exterior ballistics, Cloud cover, Humidity, Density, Tables(Data), New Mexico.
Identifiers: Little John.

Meteorological data gathered for the launching of 16201 Little John, Missile Number 3159, Round Number 706 RM, are presented in tabular form. (Author)

AD-774 876/7GA PC$3.25/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Office
14801 LANCE MISSILE NO. 2203, ROUND NO. 209 APT (7 FEBRUARY 1974).
Meteorological data rept.
Feb 74, 38p Rept no. DR-816

Descriptors: *Meteorological data, *Upper atmosphere, *Sounding rockets, *Impact prediction, Surface to surface missiles, Guided missile ranges, Atmospheric temperature, Barometric pressure, Atmospheric motion, Exterior ballistics, Cloud cover, Humidity, Density, Tables(Data), New Mexico.
Identifiers: Lance missiles, Missile modification.

Meteorological data gathered for the launching of 14801 Lance, Missile Number 2203. Round Number 209 APT, are presented in tabular form. (Author)

AD-774 877/5GA PC$3.25/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Office
12808 LANCE MISSILE NO. 2579, ROUND NO. 210 APT (7 FEBRUARY 1974).
Meteorological data rept.
Feb 74, 37p

Descriptors: *Meteorological data, *Upper atmosphere, *Sounding rockets, *Impact prediction, Surface to surface missiles, Guided missile ranges, Atmospheric temperature, Barometric pressure, Atmospheric motion, Exterior ballistics, Cloud cover, Humidity, Density, Tables(Data), New Mexico.
Identifiers: Lance missiles, Missile modification.

Meterological data gathered for the launching of 12808 Lance, Missile Number 2579, Round Number 210 APT, are presented in tabular form. (Author)

AD-774 878/3GA PC$3.25/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
14801 LANCE MISSILE NO. 2210, ROUND NO. 207 APT (31 JANUARY 1974).
Meteorological data rept.
Jan 74, 36p Rept no. DR-813

Descriptors: *Meteorological data, *Sounding rockets, *Upper atmosphere, *Impact prediction, Surface to surface missiles, Guided missile ranges, Atmospheric temperature, Barometric pressure, Atmospheric motion, Exterior ballistics, Cloud cover, Humidity, Density, Tables(Data), New Mexico.
Identifiers: Lance missiles, Missile modification.

Meteorological data gathered for the launching of 14801 Lance, Missile Number 2210, Round Number 207 APT, are presented in tabular form. (Author)

AD-775 021/9GA PC$7.00/MF$1.45
Naval Postgraduate School Monterey Calif
COMPARISON OF FLEET NUMERICAL WEATHER CENTRAL ACOUSTIC PREDICTION SYSTEM WITH THE INTEGRATED CARRIER ACOUSTIC PREDICTION SYSTEMS.
Master's thesis,
Timothy James Fitzgerald. Mar 74, 80p

Descriptors: *Weather forecasting, *Marine meteorology, *Bathythermograph data, *North Atlantic Ocean, Acoustic detection, Atmospheric temperature, Climate, Theses.
Identifiers: Comparison.

The Naval Oceanographic Office developed the Integrated Carrier Acoustic Prediction System (ICAPS) in order to perform on-scene acoustic forecasts for the Fleet. To evaluate the system, bathythermographic information was obtained for points in the North Atlantic during the naval exer-

cise 'SEACONEX.' Fleet Numerical Weather Central (FNWC) provided climatological and synoptic temperature profiles along with related acoustical forecasts for the points under study. Similarly, ICAPS supplied a combined climatological and synoptic temperature profile and related acoustic forecasts for each of the points. Comparisons of the two systems were made against an actual mean temperature profile and the acoustic forecast that it generated. (Modified author abstract)

AD-775 029/2GA PC$7.75/MF$1.45
Naval Postgraduate School Monterey Calif
LABORATORY INVESTIGATION OF ELECTRICAL DISSIPATION OF WARM FOG.
Master's thesis,
Leslie Bruce Herman. Dec 73, 93p

Descriptors: *Fog, *Weather modification, Dissipation, Electric discharges, Spray nozzles, Drops, Electrical corona, Optical detection, Coalescence, Theses.
Identifiers: *Fog dispersal.

A 27-cubic-foot fog chamber was constructed to investigate fog clearing by electrical means. Fogging of the chamber was accomplished with a spray nozzle driven by pre-humidified air, producing water droplets ranging from 10 micrometers to 75 micrometers. A corona discharge head in the center of the chamber was operated from 0 to 100 kV and measurements of fog conditions were made optically and with coated slides placed at various positions in the chamber. Rapid clearing was caused by the corona discharge. (Modified author abstract)

AD-775 044/1GA PC$4.50/MF$1.45
Advanced Technology Labs Inc Westbury N Y
DROPLET SPECTRA IN LAYER-CLOUDS,
S. Elzweig, and P. Baronti. Feb 74, 27p Rept no. ATL-TR-194 AFOSR-TR-74-0244
Contract F44620-70-C-0007

Descriptors: *Cloud physics, *Water vapor, Cumulus clouds, Condensation nuclei, Supersaturation, Evaporation, Distribution, Mathematical models.
Identifiers: Droplets.

A model is constructed for the determination of droplet spectra in layer clouds with regions of supersaturation and unsaturation, as may be the case for steady layers under a subsidence inversion. Droplet spectra distributions within the cloud have been obtained by the solution of the steady-state spray equation, which has been solved by a finite difference technique. The dependence of droplet spectra on conditions of supersaturation, population of activated nuclei and cloud thickness has been established. Distribution of supersaturation across layer clouds are not available; realistic droplet distribution are obtained, however, for estimates of supersaturation that appear reasonable. The suggestion is put forth that in widespread continental layer clouds droplet evaporation may occur at the base of the cloud and droplet condensation at the top. Also in this case, reasonable values of droplet distribution may be obtained by the use of the spray equation. (Author)

AD-775 068/0GA PC$5.00/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
ESTIMATED GLAZE ICE AND WIND LOADS AT THE EARTH'S SURFACE FOR THE CONTIGUOUS UNITED STATES.
Air Force surveys in geophysics,
Paul Tattelman, and Irving I. Gringorten. 16 Oct 73, 36p Rept nos. AFCRL-73-0646, AFCRL-AFSIG-277

Descriptors: *Climate, *Ice, *United States, Storms, Wind, Probability, Statistical data.

A climatology of glaze storms occurring in the U.S. from 1919-20 through 1968-69 was compiled. A subjective analysis of these storms was used to develop probability estimates of ice accretion for seven regions in the U.S. east of the Rocky Mountains. Estimates of combined ice and wind loads are also present. The greatest probability of severe ice storms exists from the central and northern plains through the upper midwest eastward to New England. The single point probability of at least one occurrence of an ice storm + or > 2.5 cm in one year in the northeastern U.S. is 0.0002. The single point probability of an ice storm = or > 5.0 in this same area is 0.00018. For the southeastern U.S. the probability of such occurrences in one year are 0.0004 and near zero, respectively. (Author)

AD-775 132/4GA PC$4.50/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
KINETIC EQUATION OF CLOUD PARTICLE ION CHARGING,
V. A. Borzilov, Yu. S. Sedunov, and A. S. Stepanov. 31 Jan 74, 30p Rept no. FTD-HT-23-431-74
Edited trans. of Akademiya Nauk SSSR. Izvestiya. Fizika Atmosfery i Okeana (USSR) v9 n4 p386-398 Apr 73, by Louise E. Heenan.

Descriptors: *Cloud physics, *Electrostatic charge, Aerosols, Charged particles, Ion exchange, Charge transfer, Translations, USSR.
Identifiers: Droplets.

The process of diffusion charging of interacting cloud particles is examined. It is assumed that the precipitating ions move in a field of many particles and ions. The kinetic equation for the particle distribution function with respect to charge is obtained by methods of nonequilibrium statistical mechanics. The role of collective ion-ion and ion-particle interactions in the screening of electrostatic interaction is analyzed. The conditions for the application of the obtained equation are shown. A generalization is made for the case of the action of induction forces. (Author)

AD-775 177/9GA PC$27.25/MF$1.45
National Climatic Center Asheville N C
SUMMARY OF SYNOPTIC METEOROLOGICAL OBSERVATIONS, WESTERN EUROPEAN COASTAL MARINE AREAS. VOLUME 3. AREA 12 - IRISH SEA, AREA 13 - CORK, AREA 14 - SW IRISH COAST, AREA 15 - W IRISH COAST, AREA 16 - SCOTTISH SEA, AREA 17 - OUTER HEBRIDES.
Jan 74, 484p
Sponsored in part by Naval Weather Service Command, Washington, D.C.

Descriptors: *Marine meteorology, *Coastal regions, *Western Europe, Air water interactions, Meteorological phenomena, Climate, Atmospheric precipitation, Fog, Cloud cover, Visibility, Ocean waves, Atmospheric temperature, Atlantic Ocean Islands, Ireland, Great Britain.
Identifiers: *Irish Sea, *Cork County(Ireland), *Scotia Sea, *Outer Hebrides Islands.

The data contained in these tables were obtained from Tape Data Family 11 (TDF-11) Marine Surface Observations. TDF-11 was primarily funded by the Naval Weather Service Command and selected by NWSED Asheville as the most comprehensive collection of marine surface observations from which to develop a series of Coastal Marine Summaries. The areas included are: Irish Sea; Cork; Southwest Irish Coast; West Irish Coast; Scottish Sea; and Outer Hebrides Island.

AD-775 350/2GA PC$13.75/MF$1.45
Naval Weather Service Command Washington D C
SOUTHWEST PACIFIC AND AUSTRALIAN AREA TROPICAL CYCLONE STRIKE PROBABILITIES. VOLUME I: 24-HOUR MOVEMENT. VOLUME II: 48-HOUR MOVEMENT. VOLUME III: 72-HOUR MOVEMENT,
Harold L. Crutcher, and Lee R. Hoxit. Feb 74, 213p

Descriptors: *Cyclones, *Weather forecasting, *South Pacific Ocean, *Australia, Tropical regions, Typhoons, Probability.

Probabilities relating to the future movement of Southwest Pacific and Australian area tropical cyclones are presented. The probabilities are based on observational data of successive 12-hour positions of the centers of these storms. The data are stratified into five seasons: December - January, February, March, April and May-November. Geographical areas are defined by five-degree latitude-longitude squares. The probabilities are computed assuming the initial storm position or 'origin' is always at the center of the square and the target areas are always circular areas with radii of one, two and three degrees latitude which are also located at the center of the squares. These probabilities indicate the chance of the storm center being within the target areas at the end of specified time intervals. Two sets of probabilities are presented for each square: one set for the case when the origin is at the center of the master square, and a second set for the case where the target areas are centered on this square. Values for time intervals of 72 hours are presented. (Modified author abstract)

AD-775 361/9GA PC$3.00/MF$1.45
Weather Squadron (12th) Ent AFB Colo
COMPARING CORRELATIONS BETWEEN WEATHER MAPS WITH SIMILAR ISOBARIC CONFIGURATIONS BUT VARYING PRESSURE INTENSITIES,
Peter R. Scholefield. Jul 73, 20p Rept no. Technical Paper-73-8

Descriptors: *Meteorological charts, Weather forecasting, Correlation techniques, Barometric pressure, Flow fields, Computer programs, FORTRAN.
Identifiers: FORTRAN 4 programming language, Comparison.

In all 4th Weather Wing and 12th Weather Squadron map typing studies one mathematical formula has been used exclusively as the basis for determining the similarity between weather map patterns. This paper illustrates how this linear correlation coefficient formula behaves when it is used to correlate surface weather map patterns that are similarily configured but differ in respect to their direction of flow patterns, their pressure gradients and their pressure magnitude. Ten pictorial surface weather maps are used as examples in the computer correlation procedure and the results clarify the relationship between similar map types, their pressure gradients and their degree of correlation with each other. (Author)

AD-775 362/7GA PC$3.00/MF$1.45
Air Force Global Weather Central Offutt AFB Nebr
TROPICAL ANALYSIS MODEL.
Final rept.,
James F. Brown. 1 Nov 73, 23p Rept no. AFGWC

Descriptors: *Meteorological charts, *Data processing, Tropical regions, Meteorological data, Mathematical models.
Identifiers: Numerical weather forecasting.

The AFGWC objective tropical computer analysis programs produce gridded surface pressure and temperature analyses, gridded computed temperature and D-values fields for 1000MB, temperature-dewpoint spread analyses 850-400MB, and temperature, wind and D-value analyses 850-100MB. First guess fields are derived from forecast/persistence. Validated observations are used to correct the first guess fields in the analysis. A special technique is used to insure vertical consistency. (Author)

AD-775 368/4GA PC$5.50/MF$1.45
Weather Squadron (12th) Ent AFB Colo
MAP TYPE CATALOG FOR THE CAROLINA WINDOW,
Robert C. Sabin, Richard L. Nieman, and Hal W. Wold. Jan 74, 187p Rept no. Technical Paper-74-1

Descriptors: *Meteorological charts, *Weather forecasting, *North Carolina, *South Carolina, Catalogs, Barometric pressure, Statistical data.
Identifiers: Synoptic meteorology.

A standardized procedure has been developed to determine the synoptic map types which have occurred over a specified area (window). The map type catalog is a summarization of information relating to these map types for the Carolina window. (There is a catalog for each of the 14 windows which cover the United States). The catalog includes characteristics of the map types and listings of each map in the data base (25 years of surface pressure maps) along with its most similar map type. (Author)

AD-775 369/2GA PC$5.00/MF$1.45
Weather Squadron (12th) Ent AFB Colo
MAP TYPE CATALOG FOR THE MAINE WINDOW,
Robert C. Sabin, Richard L. Nieman, and Hal W. Wold. Dec 73, 173p Rept no. Technical Paper-73-12

Descriptors: *Meteorological charts, *Weather forecasting, *Maine, Catalogs, Barometric pressure, Statistical data.
Identifiers: Synoptic meteorology.

A standardized procedure has been developed to determine the synoptic map types which have occurred over a specified area (window). The map type catalog is a summarization of information relating to these map types for the Maine window. (There is a catalog for each of the 14 windows which cover the United States). The catalog includes characteristics of the map types and listings of each map in the data base (25 years of surface pressure maps) along with its most similar map type. (Author)

AD-775 370/0GA PC$5.00/MF$1.45
Weather Squadron (12th) Ent AFB Colo
MAP TYPE CATALOG FOR THE OKLAHOMA WINDOW,
Robert C. Sabin, Richard L. Nieman, and Hal W. Wold. Oct 73, 187p Rept no. Technical Paper-73-11

Descriptors: *Meteorological charts, *Weather forecasting, *Oklahoma, Catalogs, Barometric pressure, Statistical data.
Identifiers: Synoptic meteorology.

A standardized procedure has been developed to determine the synoptic map types which have occurred over a specified area (window). The map type catalog is a summarization of information relating to these map types for the Oklahoma window. (There is a catalog for each of the 14 windows which cover the United States.) The catalog includes characteristics of the map types and listings of each map in the data base (25 years of surface pressure maps) along with its most similar map type. (Author)

AD-775 392/4GA PC$4.75/MF$1.45
Massachusetts Inst of Tech Cambridge Operations Research Center
OPTIMAL CONTROL OF SULFUR DIOXIDE EMISSIONS AT POWER STATIONS: MODELS AND A CASE STUDY.
Technical rept.,
Nitin R. Patel. Sep 73, 127p Rept no. TR-82 AROD-9239.10-M
Contract DAHC04-73-C-0032

Descriptors: *Sulfur oxides, *Meteorological phenomena, Linear programming, Mathematical models, Combustion products, Dynamic response, Stochastic processes, Electric power plants, Costs, Computer programs, FORTRAN, Theses.
Identifiers: *Air pollution control, Fossil fuels, Boston(Massachusetts), Sulfur dioxide.

The principal concern of this thesis is to analyze emission control strategies which depend upon meteorological conditions. A meterological model is developed to relate source emissions with average concentration of a pollutant in a region under different meteorological conditions. The problem of determining optimal dynamic controls for SO2 emissions at fossil-fueled power stations is treated by constructing a linear programming model. This model is extended to encompass seasonal control of sources which are not amenable to more frequent controls. Another extension is constructed to analyze the effects of errors in meteorological forecasts. The various models are applied to the Metropolitan Boston Air Pollution Control District. The impact of dynamic emission controls on new site selection for fossil-fueled power stations is examined. A stochastic linear programming formulation is developed and an algorithm is designed to solve the stochastic linear programming problem. (Modified author abstract)

AD-775 435/1GA PC$27.25/MF$1.45
National Climatic Center Asheville N C
SUMMARY OF SYNOPTIC METEOROLOGICAL OBSERVATIONS, WESTERN EUROPEAN COASTAL MARINE AREAS. VOLUME 4. AREA 18 - SHETLAND IS. NW, AREA 19 - ORKNEY ISLANDS, AREA 20 - EDINBURGH, AREA 21 - GRIMSBY, AREA 22 - RHINE DELTA, AREA 23 - BREMERHAVEN.
Jan 74, 485p
Sponsored by Naval Weather Service Command, Washington, D.C. See also Volume 3, AD-775 177.

Descriptors: *Marine meteorology, *Coastal regions, *Western Europe, Meteorological phenomena, Air water interactions, Climate, Atmospheric precipitation, Fog, Germany(East and West), Great Britain, Wind, Cloud cover, Visibility, Ocean waves, Atmospheric temperature, Atlantic Ocean Islands.
Identifiers: Shetland Islands, Orkney Islands, Edinburgh(Scotland), Grimsby(England), Rhine Delta, Bremerhaven(West Germany).

The data contained in these tables were obtained from Tape Data Family 11 (TDF-11) Marine Surface Observations. TDF-11 was primarily funded by the Naval Weather Service Command and selected by NWSED Asheville as the most comprehensive collection of marine surface observations from which to develop a series of Coastal Marine Summaries. The areas include: Shetland Islands, Orkney Islands, Edinburgh, Grimsby, Rhine Delta and Bremerhaven.

AD-775 440/1GA PC$3.75/MF$1.45
Army Engineer Topographic Labs Fort Belvoir Va
WORLDWIDE DISTRIBUTION OF MEAN MONTHLY DEWPOINT.
Special rept. Oct 72-Apr 73,
Howard L. Ohman. Nov 73, 62p Rept no. ETL-SR-74-2
Supplement to Rept. no. ETL-SR-72-4.

Descriptors: *Dew point, *Meteorological charts, Surface temperature, Statistical distributions, Maps.

Twelve maps showing the global distribution of mean surface dewpoint temperatures for each month of the year are presented as a representative sampling of mean dewpoint seasonality as it occurs at the standard surface level in the various regions of the world. The maps and graphs demonstrate that the distributional characteristics of mean dewpoint are shaped for the most part by air temperature, distance from and degree of exposure to moisture sources, and the depressing effects of elevation. The effectiveness of such controls is particularly evident in the conditions portrayed for the extreme months, namely January and July. (Author)

AD-775 444/3GA PC$6.75/MF$1.45
Pacific Missile Range Point Mugu Calif
CLIMATIC HANDBOOK FOR POINT MUGU AND SAN NICOLAS ISLAND. PART II. UPPER-AIR DATA.
Technical pub.,
Robert de Violini. 19 Jan 74, 288p Rept no. PMR-TP-74-2
Supersedes AD-864 405.

Descriptors: *Climate, *Upper atmosphere, Guided missile ranges, California, Wind, Atmospheric temperature, Density, Barometric pressure, Atmospheric sounding, Meteorological balloons, Meteorological phenomena, Handbooks, Seasonal variations, Pacific Ocean.
Identifiers: *Point Mugu(California), *San Nicolas Island.

In the handbook, upper-air climatic data for Point Mugu and San Nicolas Island relating to wind, temperature, pressure, and density between sea level and 200,000 feet (62 kilometers) are presented by both month and season. This publication is a companion volume to PMR-TP-74-1, 'Climatic Data for Point Mugu and San Nicolas Island, Part I, Surface Date.' (Author)

AD-775 459/1GA PC$3.25/MF$1.45
Army Engineer Topographic Labs Fort Belvoir Va
RAINFALL INTENSITIES IN THE CONTERMINOUS UNITED STATES AND HAWAII.
Final rept.,
Thomas E. Niedringhaus. Nov 73, 35p Rept no. ETL-SR-74-3
Supplement 1 to rept. no. ETL-SR-72-5.

Descriptors: *Rainfall intensity, *United States, *Hawaii, Probability, Distribution, Meteorological charts, Raindrops, Sizes(Dimensions).

The report and sections of Report No. 4 of the series 'Studies of Army Aviation (V/STOL) Environment' entitled Distribution of Mean Monthly Precipitation and Rainfall Intensities (ETL-SR-72-5) present maps of the distribution of rainfall intensities for durations of 5, 30, and 60 minutes and return periods of 10, 25, and 100 years within the conterminous United States and Hawaii. The 5-minute values displayed on the maps were derived from existing 30-minute maps by multiplying the 30-minute values by a constant (0.37) and interpolating between isohyets. To provide a check on the foregoing method, data for excessive precipitation from 54 U.S. weather stations were subjected to extreme value analysis, and 5-minute amounts were obtained for the various return periods.

COM-74-10463/9GA PC$5.75
National Oceanic and Atmospheric Administration, Washington, D.C. Environmental Data Service.
CATALOG OF METEOROLOGICAL SATELLITE DATA - ITOS 1 AND ESSA 9 TELEVISION CLOUD PHOTOGRAPHY, 1 JANUARY - 31 MARCH 1971.
1973, 206p KMRD-5.329 NOAA-73091911
Key to Meteorological Records Documentation.

Descriptors: *Clouds(Meteorology), *Spaceborne photography, Television reconnaissance, Aerial photographs, Meteorological satellites.
Identifiers: ITOS 1 satellite, ESSA 9 satellite.

This issue in the series of catalogs describing the television cloud photography obtained by meteorological satellites includes material from ITOS 1 and ESSA 9. It covers the period of January 1, 1971 through March 31, 1971. The maps and listings generally follow the pattern established in the 'Catalog of Meteorological Satellite Data - TIROS I Television Cloud Photography', published as No. 5.31 in the Environmental Data Service Series Key to Meteorological Record Documentation. However, digitized cloud maps replace the manually constructed nephanalyses which had been used in the previous catalogs.

There are two maps for each day; the first polar stereographic projection in each set is for the Northern Hemisphere and the second for the Southern Hemisphere. These maps are arranged according to pass day. (Author)

COM-74-10464/7GA PC$3.75/MF$1.45
National Weather Service, Silver Spring, Md. Techniques Development Lab.
SYNOPTIC CLIMATOLOGICAL STUDIES OF PRECIPITATION IN THE PLATEAU STATES FROM 850-MILLIBAR LOWS DURING FALL.
Technical memo.,
August F. Korte, and Dever Colson. Aug 72, 61p NOAA-TM-NWS-TDL-49 NOAA-74012301

Descriptors: *Climatology, *Precipitation(Meteorology), Atmospheric circulation, Meteorological charts, Seasonal variations, Utah, Idaho, Colorado, New Mexico, California, Nevada, Arizona, Wyoming, Autumn.

Presented is a synoptic climatology of precipitation from upper level lows at 850 mb over the Plateau States or intermountain region of the western part of the United States during September, October, and November. The upper Lows were classified into three intensity categories based on the departure from the mean of the central height. The average precipitation amount, distribution, and frequency of occurence are derived and related to the level, intensity, and location of the upper Low. The geographical distribution of the 850-mb Lows is shown. Precipitation amounts at 157 stations for 12-hr periods (centered at upper air observation times and expressed as percentages of 7-day station amounts) are related to the position of the Low centers by means of a moving grid system. (Modified author abstract)

COM-74-10465/4GA PC$4.00/MF$1.45
National Weather Service, Salt Lake City, Utah. Western Region.
ARIZONA 'EDDY' TORNADOES.
Technical memo.,
Robert S. Ingram. Oct 73, 13p NOAA-TM-NWS-WR-91 NOAA-74012302

Descriptors: *Tornadoes, *Arizona, Eddies, Dust storms, Wind(Meteorology), Rainfall.

Not all tornadoes and funnel clouds reported in Arizona are true tornadoes. Perhaps as many as 75 percent of them are 'eddy tornadoes', dust devils, hail shafts, or areas of heavy rain. The apparent increase from 1963 to 1973 is not believed to be related to changing meteorological conditions, but to other factors such as: increase in population; increase in public awareness due to disaster publicity; over reaction due to the 1971 tornado in Tempe; and the fact that not all localized circular storms are true tornadoes.

COM-74-10496/9GA Reprint
National Weather Service Forecast Office, Philadephia, Pa.
A SNOW COVER CLIMATOLOGY FOR PHILADELPHIA BASED ON THE WINTER SEASONS 1910-11 TO 1969-70,
Robert B. Wassall. 1973, 7p NOAA-74020107
Pub. in Weatherwise, v26 n5 p210-214 Oct 73.

Descriptors: *Snow cover, Pennsylvania, Diurnal variations, Seasonal variations, Depth, Snowstorms, Statistical data.
Identifiers: *Philadelphia(Pennsylvania).

Philadelphia daily snow depth records for the 60 winters from 1910-11 to 1969-70 were analyzed and summarized in the report. There is no evidence to support the belief that snow-cover was more common in the early part of the 20th century. A slight decrease noted in the more recent 30 years is considered insignificant. The ground was never covered with snow from Thanksgiving until Easter, and so-called 'knee-deep' snows were certainly an infrequent occurrence. The date with the greatest liklihood of having snow-cover is February 2nd. Extended periods of continuous snow-cover are also most likely to occur in February. Year-to-year variability in snow-cover is great. Based on snow-cover statistics, the winter of 1960-61 was probably the most severe in the 1910-70 period.

N74-15332/1GA PC$3.25/MF$1.45
Rima (Alessandro), Muralto (Switzerland).
REPORT ON THE NUMBER OF TROPICAL CYCLONES OBSERVED OVER WESTERN AUSTRALIA (1889 - 1969) NOTA SUL NUMERO DEI CICLONI TROPICALI OSSERVATI SULL'AUSTRALIA OCCIDENTALE (1889 - 1969).
A. Rima. Jan 72, 25p RI/CD/30
Subm-Sponsored by Western Australia Univ.
Language in Italian.

Descriptors: *Australia, *Cyclones, *Tropical meteorology, Periodic variations, Precipitation (Meteorology), Statistical analysis.

For abstract, see STAR 1206

N74-15333/9GA PC$4.50/MF$1.45
Deutscher Wetterdienst, Offenbach am Main (West Germany).
THE DEVELOPMENT OF METEOROLOGICAL OBSERVATIONS IN FRANCONIA AND BAVARIA UP TO 1780 DIE ENTWICKLUNG DER METEOROLOGISCHEN BEOBACHTUNGEN IN FRANKEN UND BAYERN BIS 1780.
F. Klemm. 1973, 49p REPT-8
Language in German.

Descriptors: *Germany, *Meteorological parameters, *Meteorological services, *Weather stations, Bibliographies, Documentation, Histories.

For abstract, see STAR 1206

N74-15334/7GA PC$4.00/MF$1.45
Centre Meteorologique Regional de Marignane (France).
NORTH, WEST, AND NORTHWEST WINDS OF MARSEILLES FROM 1882 TO 1970 (STATISTICAL ANALYSIS) VENTS DE NORD-OUEST ET MISTRAL A MARSEILLE DE 1882 A 1970 (ESSAI STATISTIQUE).
C. Bordreuil, A. Barbia, and P. Comte. Sep 73, 39p MONOGRAPH-88
Language in French.

Descriptors: *France, *Statistical analysis, *Wind variations, Atmospheric temperature, Precipitation (Meteorology), Tables (Data).

For abstract, see STAR 1206

N74-15348/7GA PC$4.25/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
A RADIOSONDE THERMAL SENSOR TECHNIQUE FOR MEASUREMENT OF ATMOSPHERIC TURBULENCE.
J. L. Bufton. Nov 73, 45p NASA-TM-X-70556, X-524-73-365

Descriptors: *Atmospheric turbulence, *Radiosondes, *Temperature measurement, Atmospheric temperature, Lasers, Micrometeorology, Remote sensors, Weather forecasting.

For abstract, see STAR 1206

N74-15358/3GA PC$12.75/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
DATA FOR FIRST NASA ATMOSPHERIC VARIABILITY EXPERIMENT (AVE 1). PART 1: DATA TABULATION.
J. R. Scoggins, and O. E. Smith. Dec 73, 684p NASA-TM-X-2938
Contract NAS8-26751

Descriptors: *Earth atmosphere, *Meteorological parameters, *Rawinsondes, Data processing, Nasa programs, Tables (Data).

For abstract, see STAR 1206

N74-15356/8GA PC$4.75/MF$1.45
Institut Royal Meteorologique de Belgique, Brussels.
THE WEATHER IN 1972 LE TEMPS EN 1972.
R. Sneyers. 1973, 54p PUBL-SER-B-72
Language in French.

Descriptors: *Belgium, *Precipitation (Meteorology), *Weather stations, *Wind variations, Annual variations, Atmospheric moisture, Atmospheric temperature, Clouds (Meteorology), Haze, Insolation, Meteorological charts.

For abstract, see STAR 1206

N74-15357/8GA PC$3.25/MF$1.45
Institut Royal Meteorologique de Belgique, Brussels.
ADIABATIC AND ISOBARIC MIXING OF AIR MASSES ADIABATISCHE EN ISOBARISCHE MENGING VAN LUCHTMASSA'S.
E. Dedycker, and L. Dufour. 1973, 22p PUBL-SER-B-73
Language in Dutch.

Descriptors: *Adiabatic conditions, *Atmospheric moisture, *Isobars (Pressure), Atmospheric temperature, Fog, Thermodynamics, Water vapor.

For abstract, see STAR 1206

ORO-4199-2 PC$12.00/MF$1.45
Maryland Univ., College Park (Usa). Inst. For Fluid Dynamics and Applied Mathematics.
THEORETICAL RESEARCH ON THE STABILITY OF THERMALLY STRATIFIED VISCOUS PARALLEL FLOW. FINAL REPORT.
K. S. Gage. Aug 73, 200p BN-778
Contract AT(40-1)-4199

Descriptors: (*Earth atmosphere, *Turbulence), (*Fluid flow, *Shear), Aircraft, Helmholtz instability, Layers, Meteorology, Research programs, Stability, Thermal diffusivity, Wind.

For abstract, see NSA 29 05, number 12477.

PB-227 892/7GA PC$4.50/MF$1.45
Cornell Univ., Ithaca, N.Y. Cornell Energy Project.
STATUS AND CONSEQUENCES OF URBAN HEAT REJECTION,
Kenneth E. Torrance. Feb 72, 28p Paper-72-5
NSF-RA/N-72-006
Grant NSF-GI-29903

Descriptors: *Climate, *Urban areas, Atmospheric temperature, Atmospheric circulation, Climatic changes, Temperature distribution, Heat transfer, Mathematical models.
Identifiers: *Urban heat islands.

The paper presents a summary of present and future rates of waste heat rejection in urban areas. Present rates of heat rejection are taken from compilations in the current literature. Future rates of heat are obtained by extrapolating present data using energy demand forecasts. Although the exact impact of heat rejection on urban climate is still not known, some very approximate estimates can be made. These estimates are projected into the future. The results are of interest for assessing whether or not urban heating effects are likely to limit the future use of energy by society. (Author)

PB-228 566/6GA PC$3.75/MF$1.45
Woods Hole Oceanographic Institution, Mass.
OBSERVATIONS AND INTERPRETATION OF TURBULENCE, WIND VARIATIONS AND

SHOWERS IN THE TROPICAL MARINE BOUNDARY LAYER.
Final rept.,
Andrew F. Bunker. Dec 73, 70p WHOI-73-90
Grant NSF-GA-31568

Descriptors: *Marine atmospheres, *Turbulent boundary layer, Tropical regions, Marine meteorology, West Indies, Wind(Meteorology), Turbulence.
Identifiers: BOMEX(Barbados Oceanographic and Meteorological Experiment), Barbados oceanographic and meteorological experiment.

Measurements of turbulence and turbulent fluxes made from a C-54Q aircraft during BOMEX are summarized and compared with measurements made by other groups. The distribution of showers, turbulence and other parameters within the large-scale disturbances have been measured and averaged. It was found that the turbulence in the sub-cloud layer varies systematically in the vicinity of showers. A minimum is noted about 3 to 4 shower diameters from the shower. A secondary maximum, two thirds the strength of the maximum within the shower, is observed 6 to 10 diameters from the shower. The winds observed from Oceanographer during Phase III of BOMEX were used, together with aircraft turbulence data to evaluate the various effects of stability, secondary instability circulations, cumulus convection and periodic pressure changes. (Modified author abstract)

PB-228 757/1GA PC$5.00/MF$1.45
Illinois State Water Survey, Urbana.
CLIMATOLOGICAL ASSESSMENT OF URBAN EFFECTS ON PRECIPITATION. PART I. SUMMARY AND CONCLUSIONS.
Final rept. 1970-72,
F. A. Huff, and S. A. Changnon, Jr. May 72, 39p ISWS-72-CON-129
Grant NSF-GA-18781
See also Part 2, PB-228 758.

Descriptors: *Climatic changes, *Precipitation(Meteorology), *Urban areas, Thunderstorms, Hail, Rainfall, Weather modification, Climatology, Air pollution.
Identifiers: St. Louis(Missouri), Chicago(Illinois), Indianapolis(Indiana), District of Columbia, Cleveland(Ohio), Houston(Texas), New Orleans(Louisiana), Urban heat islands, Tulsa(Oklahoma).

This is a two-year project involving extensive climatological analyses of urban effects on precipitation in and around eight major cities in central and eastern United States. Analyses were made initially of monthly and seasonal precipitation within a radius of 50 to 75 miles of the cities. Diurnal rainfall distributions are discussed for St. Louis, Chicago, Cleveland, and Washington. Evidence was weak or non-existent at Indianapolis, Tulsa, and New Orleans. Urban effects at Houston could be identified only in May-September rainfall of air mass origin. The urban effect appears to be more pronounced in summer than in winter and usually maximized 10-35 miles downwind of the central city. Six cities had thunder increases ranging from 13 to 47% above the climatic background, and the maximum area or point increases in hail ranged from 90 to 350%.

PB-228 758/9GA PC$15.25/MF$1.45
Illinois State Water Survey, Urbana.
CLIMATOLOGICAL ASSESSMENT OF URBAN EFFECTS ON PRECIPITATION. PART II. DESCRIPTION OF INDIVIDUAL URBAN STUDIES.
Final rept. 1970-72,
F. A. Huff, and S. A. Changnon, Jr. May 72, 242p ISWS-72-CON-133
Grant NSF-GA-18781
See also Part 1, PB-228 757.

Descriptors: *Climatic changes, *Precipitation(Meteorology), *Urban areas, Thunderstorms, Hail, Rainfall, Weather modification, Climatology, Air pollution, Meteorological data.
Identifiers: St. Louis(Missouri), Chicago(Illinois), Indianapolis(Indiana), District of Columbia, Cleveland(Ohio), Houston(Texas), New Orleans(Louisiana), Urban heat islands, Tulsa(Oklahoma).

The basic purpose of Part II of this Final Report is to provide detailed descriptions of individual studies made at each of the eight cities where urban effects on precipitation were investigated. The climatological research at each city is discussed separately with respect to data, analytical procedures, results, and conclusions. Part II serves as a single source of all findings at each city studies. Part II should be used as a supplement to Part I (Summary and Conclusions) which provides additional, pertinent information on the purpose and scope of the research project, basic sources of data, analytical limitations, analytical methods adopted, and evaluation techniques used in the studies. Also, Part I provides an overall summary of findings at the eight cities and the general implications of these findings with respect to urban effects on precipitation. Thus, use of both reports is recommended for a full understanding of the individual studies described here.

PB-228 819/9GA PC$6.00/MF$1.45
Illinois State Water Survey, Urbana.
CLIMATIC STUDIES OF EXTRA-AREA EFFECTS FROM SEEDING.
Technical rept. no. 5, 1971-73,
P. T. Schickedanz. 30 Jun 73, 60p ISWS-73-CON-146
Contract DI-14-06-D-7197

Descriptors: *Artificial precipitation, *Weather modification, Urbanized areas, Cloud seeding, Seasonal variations, Illinois, Correlation techniques, Weather observations, Volume, Rainfall, Distribution(Property), Meteorological data.

Two climatic investigations concerning detection of alterations of precipitation beyond a target area were pursued. In the first investigation, monthly and seasonal precipitation data were used to study the natural distribution of highs and lows in precipitation patterns over a 325,000 sq mi area centered in southern Illinois during the period 1950-69. The implications were two-fold: (1) the mean and median distances between natural occurring precipitation highs in the Midwest are in the range of downwind highs reported caused by seeding; (2) the broadness of the correlation pattern between points in a pattern indicates that one must be very cautious when postulating extra-area effects out to distances as great as 300 miles from the target in weather modification experiments. The second investigation concerned the monthly and seasonal precipitation patterns (1950-69) in and downwind of large cities having urban-induced increases in precipitation. Overall the results indicated that the urban effect is limited to 50 miles of the city, and that no downwind effect occurs beyond 50 miles. (Modified author abstract)

PB-228 820/7GA PC$7.25/MF$1.45
Illinois State Water Survey, Urbana.
MODELING STUDIES FOR EVALUATION AND PLANNING OF PRECIPITATION ENHANCEMENT IN ILLINOIS.
Technical rept. no. 6, 1972-73,
H. T. Ochs, III, and B. C. Ceselski. 30 Jun 73, 84p ISWS-73-CON-147
Contract DI-14-06-D-7197

Descriptors: *Artificial precipitation, *Weather modification, Weather forecasting, Cloud seeding, Mathematical models, Cumulus clouds, Atmospheric sounding, Convection, Numerical analysis, Turbulent diffusion, Boundary layer, Cloud physics, Illinois.
Identifiers: Numerical weather forecasting, Mesoscale meteorology.

The development of a complex 2-dimensional, time-dependent, cloud-scale numerical model which depicts atmospheric convection and cumulus growth in a vertical cross section of the atmosphere was performed to determine the magnitude and extent of the possible extra-area effects of planned weather modification. A relatively large-scale (meso- to synoptic-scale) 3-dimensional modeling effort was initiated. The model was being adapted as an advanced prognostic tool to be used with field operations, and as a diagnostic tool to investigate potential extra-area effects of artificially-seeded organized convection. A 1-dimensional cloud model was adapted for use in a climatology of seeding-potential study. Ten years of data from 4 midweastern radiosonde stations provided the input to the model. The model, in turn, produced a long-period, regional data set of potential seeding effects and large-scale atmospheric conditions. (Modified author abstract)

PB-228 855/3GA PC$6.25/MF$1.45
Illinois State Water Survey, Urbana.
1973 OPERATION REPORT FOR METROMEX.
Annual operation rept.,
William P. Lowry. Dec 73, 65p ISWS-73-CON-150
Grant NSF-GI-34797

Descriptors: *Urban areas, *Weather modification, Climatic changes, Synoptic meteorology, Research programs, Missouri.
Identifiers: Metromex project, Urban heat islands, Inadvertent weather modification, *St. Louis(Missouri).

Project METROMEX is a federation of individual scientists with diverse sources of funding but complementary research objectives. The report describes the calendar of field observations conducted under METROMEX in the Greater St. Louis area during June-August 1973. Greater detail on the calendar is found in the reports of individual cooperators in this report. All METROMEX activities in 1973 are described including analytical plans and the 6 science groups involved. (Author)

PB-229 022/9GA PC$5.00/MF$1.45
Illinois State Water Survey, Urbana.
SUMMARY REPORT OF METROMEX STUDIES, 1971-1972.
Rept. of investigations,
Floyd A. Huff. Oct 73, 175p ISWS-73-RI-74

Descriptors: *Urban areas, *Weather modification, Synoptic meteorology, Fronts(Meteorology), Thunderstorms, Hail, Rainfall, Wind(Meteorology), Atmospheric temperature, Humidity, Atmospheric chemistry, Climatic changes, Missouri.
Identifiers: Metromex project, Urban heat islands, Inadvertent weather modification, *St. Louis(Missouri).

Metromex is a large-scale investigation of inadvertent weather modification in an urban area, sited at St. Louis. Analyses to date from 2 years of data collected in the 5-year Metromex field program are summarized in this report. It includes extensive climatological-statistical analyses of rainfall and severe weather events and partial analyses for various atmospheric studies for which data are as yet limited. The 2-year results provide evidence that rain, thunderstorms, and hail maximize at locations 10 to 15 miles downwind of the urban-industrial region. These locations had more storms that were more intense, lasted longer, and produced greater amounts of rain and hail. Results also show that the atmosphere modified by heat and various emissions in the urban area does move up to levels where it can affect clouds and that the urban-modified atmosphere acts to invigorate convective storms and to increase the efficiency of precipitation events. Data and conclusions in this 2-year report provide a variety of information on urban effects on weather not obtainable in existing literature. (Author)

PB-229 334/8GA PC$4.25/MF$1.45
California State Div. of Highways, Sacramento. Transportation Lab.
EVALUATION OF A METHOD OF FOG DISPERSAL BY IONIZATION.
Final rept.,
Gerald R. Bemis, Kenneth O. Pinkerman, and Earl C. Shirley. Jul 73, 24p CA-DOT-TL-7128-1-73-23, 657128

Descriptors: *Fog dispersal, Ionization, Experimental design.

The effectiveness of a truck-mounted ionized, water-surfactant fog dispersal technique was evaluated under controlled conditions. The amount of time required for an untreated fog in a chamber to attain a reference visibility (450 feet as estimated by a human observer) was compared to the time required for a treated fog to reach the same reference visibility. The time required to reach 450 feet in the untreated fog was not significantly different than the time required to reach 450 feet with any of the contractor's applications of dispersal treatment. Based on these data, it was concluded that the fog dispersal technique used by the Contractor did not demonstrate effectiveness in dispersing fog in a controlled environment. (Author)

5. BEHAVIORAL AND SOCIAL SCIENCES

5A. Administration and Management

N74-15671/2GA PC$12.00/MF$1.45
Drexel Univ., Philadelphia, Pa. Center for the Study of Environment.
RESEARCH AND EDUCATION IN MANAGEMENT OF LARGE-SCALE TECHNICAL PROGRAMS.
Final Report.
W. W. Hagerty, E. S. Golden, A. J. Pennington, M. Silver, and H. H. Annett. 2 Jun 73, 196p NASA-CR-136563
Contract NGL-39-004-020

Descriptors: *Management planning, *Nasa programs, *University program, *Urban development, Decision making, Game theory, Management methods, Problem solving, Sociology, Technology transfer.

For abstract, see STAR 1206

N74-15692/8GA PC$1.55/MF$1.45
National Academy of Public Administration, Washington, D.C.
PROJECT MANAGEMENT IN NASA: THE SYSTEM AND THE MEN.
R. H. Pontious, and L. B. Barnes. 1973, 137p NASA-SP-324, LC-73-600068
Contract NSR-09-046-001

Descriptors: *Management analysis, *Nasa programs, *Project management, Management methods, Management systems, Technology transfer.

For abstract, see STAR 1206

PB-228 486/7GA PC$4.25/MF$1.45
Minneapolis Community Planning and Management Team, Minn.
HANDBOOK OF TENANTS' AND LANDLORDS' RIGHTS AND DUTIES.
Oct 73, 21p H-HTLRD-738
Revision of report dated Feb 73.

Descriptors: *Leasing, *Residential buildings, *Handbooks, Rates(Costs), Information, Litigation, Legislation, Land, Stopping.
Identifiers: *Landlord tenant relationships, Rights and duties, Precautions, Rents.

The handbook was published as a citizen service by the Housing Elements Program. It discusses cautions a tenant should take when signing a lease, terminating the lease by either the landlord or the tenant, rent increases, landlords' and tenants' obligations, and rights to tenant privacy. It also informs people where to seek further information and assistance and discusses conciliation court procedures for tenant-landlord difficulties. The handbook updates and revises a previous draft that was published by HEP for discussion and feedback. The second version also includes a section on new laws governing damage and security deposits and automatic renewal of the lease.

PB-228 900/7GA PC$17.25/MF$1.45
Louis, Bowles and Grove, Inc., Dallas, Tex.
FILTERING EFFECTS OF SUBSIDIZED RURAL HOUSING. VOLUME I.
Final rept.
20 Jul 73, 283p HUD-PDR-205-a
Contract HUD-H-2088

Descriptors: *Housing studies, *Rural areas, *Subsidy programs, *Federal housing programs, Quality, County planning, Surveys, Missouri, South Carolina, Ethnic groups, Questionnaires, Texas, Mississippi, Interviews, Attitudes.
Identifiers: Subsidized housing, *Housing and urban development research.

The report presents the findings from four separate surveys conducted in rural counties of Missouri, South Carolina, Texas and Mississippi. The central objective of the surveys was to investigate the nature of filtering effects associated with subsidized housing programs administered by the Farmers Home Administration.

PB-229 346/2GA PC$4.50/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
EVALUATION OF PROPOSED SINGLE FAMILY SUBSIDY PROGRAM.
Final rept.,
Sheldon L. Baskin. 15 Jun 73, 27p HUD-PDR-435-b

Descriptors: *Housing planning, *Project planning, *Financing, *Subsidies, Mortgages, Low income families, National housing goals, Purchasing, Loans, Federal policies, Economic analysis, Requirements.
Identifiers: *Housing and urban development research, Subsidized housing, Single family houses.

The report concludes that the proposed single family subsidy program should be a significant factor in increasing the production of single family housing. Various points are raised such as the impact of the administrative burden of the program; the extent of repayment obligation on the purchaser, the federal income tax impact of the subsidy, adequate cost limits for eligible homes, and application of federal requirements which the developer could avoid by not making the program available to purchasers. All these must be dealt with satisfactorily in the program for it to operate effectively.

5B. Documentation and Information Technology

AD-774 791/8GA PC$4.75/MF$1.45
Massachusetts Inst of Tech Cambridge Research Lab of Electronics
QUARTERLY PROGRESS REPORT NO. 112.
Progress rept. for period ending 31 Nov 73,
H. J. Zimmermann, J. G. King, and S. J. Mason. 15 Jan 74, 150p
Contract DAAB07-71-C-0300
See also Quarterly progress rept. no. 111, AD-769 891.

Descriptors: *Scientific research, *Quantum electronics, *Radio astronomy, *Plasmas(Physics), *Communication and radio systems, Molecular spectroscopy, Microscopy, Electron optics, Gas lasers, Gravity, Data processing, Information theory, Signal processing, Speech, Linguistics, Biophysics, Nervous system, Electrodynamics.
Identifiers: *Plasma dynamics, *Neurophysiology.

Contents: Molecule microscopy, electron optics, physical electronics and surface physics, atomic resonance and scattering, quantum electronics, gravitation research, microwave and millimeter wave techniques, radio astronomy, electrodynamics of media, transport phenomena in solids, physical acoustics, plasma dynamics, processing and transmission of information, detection and estimation theory, digital signal processing, speech communication, linguistics, cognitive information processing, communications biophysics, and neurophysiology.

AD-774 864/3GA PC$3.25/MF$1.45
Office of Naval Research London (England)
EUROPEAN SCIENTIFIC NOTES. VOLUME 27, NUMBER 12,
Arthur W. Frisch, and Victoria Hewitson. 31 Dec 73, 43p Rept no. ESN-27-12
See also AD-773 735.

Descriptors: *Scientific research, *Europe, Space exploration, Chemistry, Engineering, Medicine, Psychology, Physics, Naval research, Mathematics, Oceanography, Periodicals, Reviews, Great Britain.

The monthly publication presents brief articles concerning recent developments in European scientific research. The articles are written by members of the scientific staff of ONRL, with an occasional article contributed by a visiting stateside scientist. (Modified author abstract)

AD-775 149/8GA PC$4.00/MF$1.45
Applied Science Associates Inc Valencia Pa
DEVELOPMENT OF A TECHNICAL DATA FILE ON THE DESIGN AND USE OF INSTRUCTIONAL SYSTEMS.
Final rept. 15 Jun 72-15 Jun 73,
Sanford P. Schumacher. Dec 73, 77p AFHRL-TR-73-41
Contract F33615-72-C-1884

Descriptors: *Information systems, *Training, Abstracts, Subject indexing, Index terms, Data processing, Standards.
Identifiers: Subject index terms.

The report describes the development of a technical data file concerned with the technology of instructional system development suitable for a variety of users. The file was prepared in a way amenable to later computerized storage and retrieval. Abstracts of articles reporting sampling studies, correlational analysis, and experimental data were prepared more comprehensively so that they might often be used in lieu of the article. The principal results of the effort are as follows: A paper file of 2693 abstracts; a card file of titles; a coordinate index; a comprehensive key word index and bibliography; and MT/ST tapes of 1950 of the abstracts. Incidental to the development, comprehensive guidelines for abstracting this type of literature and a compendium of author-noted research-and-development needs were prepared. (Modified author abstract)

AD-775 509/3GA PC$3.75/MF$1.45
Battelle Columbus Labs Ohio
ANNUAL REPORT OF THE METALS AND CERAMICS INFORMATION CENTER.
Report for 1 Aug 72-31 Jul 73,
H. Dana Moran, and J. F. Lynch. 1 Oct 73, 64p AMMRC-CTR-74-5
Contract DSA900-73-C-0922

Descriptors: *Technical information centers, *Metals, *Alloys, *Ceramic materials, Costs, Operation, Data processing security, Information retrieval.

The DoD, in 1955 established the Titanium Metallurgical Laboratory at Battelle-Columbus, expanding the scope and changing the name to Defense Metals Information Center in 1958. The Defense Ceramic Information Center was assigned to Battelle in 1967. The two centers were combined in 1971 forming the Metals and Ceramics Information Center (MCIC). This is the second annual report on the MCIC program, covering activities for the period 1 August 1972 through 31 Jul 1973 – essentially the FY73 period. This was the first full year of operations under the 'full service charge' policy. The first nongovernment site terminal, providing direct access to the DDC Defense RDT and E system, was installed in MCIC's facilities. After extensive checkout and user training, the terminal went 'on-line' in January 1973, and has proven of substantial benefit to the MCIC mission. (Modified author abstract)

AD-775 582/0GA PC$5.25/MF$1.45
Royal Aircraft Establishment Farnborough (England)
SWEDISH DEFENCE RESEARCH ABSTRACTS 72/73-1 (FRO FORSVARS FORSKNINGS REFERAT 72/73-2).
28 Aug 73, 44p Rept no. RAE-Library Trans-1732
DRIC-BR-39428
Trans. of Forsvarets Forskningsanstalt, Stockholm, Rapport (Sweden) FRO-72/73-2, by F. W. Read. See also AD-768 254.

Descriptors: *Scientific research, *Sweden, Translations, Reports, Abstracts, Communication and radio systems, Physics, Bionics, Military psychology, Weapon systems, Logistics, Weapon systems, Nuclear reactors, Nuclear explosion damage, Chemistry, National defense.

The Swedish Research Institute for NATIONAL Defence issues a quaterly list of unclassified Reports published by the Institute. The titles of these Reports and informative abstracts have been translated into English. This volume covers the second quarter of 1972/73. The main topics covered are: Protection - atomic, biological, chemical; ammunition and weapons; conduct of war; information and command; vehicles and spacecraft; reliability and logistics; human factors; associated studies and their solutions.

JPRS-61234 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
ALL-UNION STATE STANDARD GOST 15845-70: CABLES, WIRING, AND CORDS, TERMS AND DEFINITIONS.
14 Feb 74, 25p
Trans. of Kabeli, Provoda i Shnury, Terminy i Opredeleniya, Moscow, GOST 15845-70 20p 1970.

Descriptors: *Dictionaries, Standards, Transmission lines, Electric wire, Wiring, Translations, USSR.

The report contains a standardization of terms and definitions of basic concepts concerning cables, wiring and cords used in science, engineering and industry.

N74-15058/2GA PC$3.75/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
NOTES FOR THE IMPROVEMENT OF THE SPATIAL AND SPECTRAL DATA CLASSIFICATION METHOD.
C. C. Dalton. 23 Jan 74, 33p NASA-TM-X-64801

Descriptors: *Classifications, *Earth resources technology satellites, *Mapping, Algorithms, Data processing, Multispectral photography, Pattern recognition, Skylab program.

For abstract, see STAR 1206

PB-228 258/0GA PC$11.50/MF$1.45
Informatics, Inc., Rockville, Md.
ANALYSIS OF INFORMATION REQUIREMENTS OF THE NOISE ABATEMENT COMMUNITY.
Final rept.
24 May 72, 168p TR-72-1533-02
Contract EPA-68-01-0512

Descriptors: *Noise reduction, *Information systems, Information centers, Information retrieval, Information retrieval effectiveness, Communications management, Market research, Documents.

The report provides a definition of the noise information community. An a priori model of this community was established and the information requirements were determined through an activity analysis. This conceptual model was then expanded and verified through a series of personal interviews. The highlights of the findings include: The interest of this community in noise is heterogeneous and there is no single information product or service indentifiable which would satisfy all needs. There are now in existence many information services. However, the majority of information users are either not aware of these services or are unable to benefit from them. Those people whose activities have the greatest impact on the national noise climate operate with the least amount of information support. Recommendations to alleviate this situation are presented.

PB-228 677/1GA PC$9.00/MF$1.45
Systems Research Co., Philadelphia, Pa.
NIOSH OCCUPATIONAL SAFETY AND HEALTH THESAURUS--FIRST EDITION.
Final rept.,
Thomas T. Luginbyhl, Lorice Ede, Robert H. Hill, Jr., and Kenneth D. Kreitel. Oct 73, 548p*
NIOSH-TR-106-74
Contract HSM-99-72-36

Descriptors: *Industrial medicine, *Thesauri, *Subject index terms, Terminology, Information systems, Information retrieval, Occupational diseases, Industrial hygiene, Health, Safety engineering.
Identifiers: *Occupational safety and health.

The thesaurus is a computer-generated vocabulary of technical and scientific terms related to, or in common use in, disciplines contributing to the field of occupational safety and health. The thesaurus is developed as a part of the National Institute for Occupational Safety and Health technical information system for use in abstracting, indexing, and searching its contents. The NIOSH system is a technical information storage and retrieval system which has an initial data base of technical and scientific documents in and available to NIOSH. The NIOSH Thesaurus is designed to provide a system abstracter and indexer with the terms which will be characteristic and indicative of the input information and can be used for obtaining the query-specified output information. The corollary design objective is to provide the system querier with the logical terms which will prove productive and effective in a computer search of the system files for information. The thesaurus is comprised of some 15,000 main terms and 50,000 subterms. Portions of this document are not fully legible.

PB-228 761/3GA PC$5.00/MF$1.45
United Nations Educational, Scientific and Cultural Organization, Paris (France).
UNISIST STEERING COMMITTEE FIRST SESSION, PARIS, 5-9 NOVEMBER 1973,
Final rept.
31 Jan 74, 37p SC/MD/38

Descriptors: *Information systems, *Developing countries, Technology transfer, International relations, Meetings, Proceedings.
Identifiers: United Nations, UNISIST Steering Committee, International Serials Data System.

The Steering Committee is responsible for guiding and supervising the planning and implementation of the UNISIST Program. The report contains along with the committee's administrative matters, their examination of the UNISIST current program and its priority projects.

PB-228 883/5GA PC$6.75/MF$1.45
Ohio State Univ., Columbus. Computer and Information Science Research Center.
TECHNIQUES FOR THE EVALUATION AND IMPROVEMENT OF COMPUTER-PRODUCED ABSTRACTS.
Technical rept. series,
Betty Ann Mathis. Dec 72, 278p* OSU-CISRC-TR-72-15
Grant NSF-GN-534.1

Descriptors: *Automatic abstracting, *Computational linguistics, Abstracts, Computer programming, Document announcement, Information retrieval, Evaluation.
Identifiers: IBM 370 computers.

An automatic abstracting system, named ADAM, has been implemented on the IBM 370. An algorithm has been developed which considers every sentence in the input text and rejects sentences which are not suitable for inclusion in the abstract. The quality of the abstracts can be evaluated by means of a two-step evaluation procedure. The first step of the procedure determines the conformity of the abstracts to the defined criteria for an acceptable abstract for the given system. The second step provides an objective evaluation criterion for abstract quality based on a comparison of the abstract with its parent document. The second step is based on the assumption that an abstract should present the maximum amount of data from the parent document in the minimum amount of length. Based on the results of this evaluation, several techniques have been developed to improve the quality of the abstracts. These procedures modify the form, arrangement, and content of the sentences selected for the abstract. (Author)

PB-229 260/5GA PC$5.00/MF$1.45
Ohio State Univ., Columbus. Computer and Information Science Research Center.
A GENERALIZED CONCEPTUAL DEVELOPMENT FOR THE ANALYSIS AND FLOW OF INFORMATION,
B. J. Whittemore, and M. C. Yovits. Dec 72, 37p
OSU-CISRC-TR-72-14
Grant NSF-GN-534.1

Descriptors: *Information sciences, *Information, *Decision making, Information theory, Effectiveness, Analyzing, Probability theory.

A generalized framework for developing analytical and conceptual relationships involving the flow of information is refined. In particular, a measure of the amount of information is defined as the difference of the value of the decision state of the decision-maker after and before receipt of the message. This measure is universally applicable for all information that is concerned with the effectiveness of the message upon the recipient. The use of a generalized information system model permits the evaluation of the measure of information in terms of the reduction of uncertainty to a decision maker. Six different types of uncertainty are identified. A suggested rule which is convenient and reasonable is proposed for evaluating the decision state of a decision-maker at any point in time. The measure of information suggested is situation, time, and decision-maker dependent. The framework and relationships developed are an important step toward the development of a true theory of information science. (Modified author abstract)

PB-229 499/9GA PC$6.50/MF$1.45
Ohio State Univ., Columbus. Computer and Information Science Research Center.
THE DOUBLE-KWIC COORDINATE INDEXING TECHNIQUE: THEORY, DESIGN, AND IMPLEMENTATION,
Technical rept.,
William Michael Lay. Feb 73, 265p* OSU-CISRC-TR-73-1
Grant NSF-GN-534.1

Descriptors: *Automatic indexing, *Coordinate indexing, Indexes(Documentation), Information retrieval, Theories, Design, Subject index terms.
Identifiers: *Double KWIC indexes.

The double-KWIC (DKWIC) coordinate indexing technique represents a new method for generating high-quality printed indexes by relatively simple automated techniques. The prototype system embodied two fundamental operations for creation of index entries from a title or title-like phrase: (1) The first significant word (or phrase) of the title was extracted as a potential main term (PMT) and replaced by an asterisk to indicate its position within the title; (2) the remaining words of the title were rotated so as to allow each significant word to appear as the first word of a wrap-around subordinate entry under the PMT. Subsequent refinements of the prototype system include: (1) Introduction of some automated vocabulary control features to eliminate scattering caused by singular and plural main terms; (2) replacement of the prototype D-KWIC indexing system by a KWOC-D-KWIC hybrid system to reduce the size and improve the quality of the indexes produced; (3) subsequent introduction of a KWIC-D-KWIC hybrid system to automate the main term selection process which previously required a human interface step in each of the earlier systems.

5C. Economics

AD-774 785/0GA Reprint
Yale Univ New Haven Conn Cowles Foundation for Research in Economics
INFORMATION, DUOPOLY AND COMPETITIVE MARKETS: A SENSITIVITY ANALYSIS,
Martin Shubik. 1973, 30p Rept no. Foundation Paper-400
Contract N00014-67-A-0097-0011
Summaries in French and German. Supersedes AD-754 124.
Availability: Pub. in Kyklos, v26 n4 p736-761 1973.

Descriptors: *Economic models, Sensitivity, Bargaining, Information, Game theory.
Identifiers: Duopolies, Sensitivity analysis, Competition, Marketing, Oligopolies.

The paper is devoted to exploring the variations of information conditions for an extremely simple set of duopoly models. An interpretation of the sensitivity of solutions to changes in information is given and the effect of increasing the number of competitors is considered.

AD-774 928/6GA PC$3.00/MF$1.45
Yale Univ New Haven Conn Cowles Foundation for Research in Economics
A THEORY OF MONEY AND FINANCIAL INSTITUTIONS. PART XV. A TRADING MODEL TO AVOID TATONNEMENT METAPHYSICS,
Martin Shubik. 13 Feb 74, 20p* Rept no. Discussion Paper-368
Contract N00014-67-A-0097-0011
See also Part 13, AD-774 093.

Descriptors: *Economic models, *Commerce, Bargaining, Equilibrium(General), Game theory, Strategy.
Identifiers: Duopolies, Prices, Utility functions, Bids.

The article is devoted to examining some of the problems involved in specifying an explicit trading mechanism which enables one to consider price formation in a non-tatonnement context. In other words, this is where offers to buy or sell which are accepted are contracted regardless of what happens to the rest of the market. The traders live with and pay for their errors. A simple two-sided market is examined. It is sufficiently simple that it can be examined experimentally.

AD-774 950/0GA Reprint
Yale Univ New Haven Conn Cowles Foundation for Research in Economics
FIAT MONEY IN AN ECONOMY WITH ONE NONDURABLE GOOD AND NO CREDIT,
M. Shubik, and W. Whitt. 1973, 53p Rept nos. Foundation Paper-389, Discussion Paper-355
Contract N00014-67-A-0097-0011
Availability: Pub. in Topics in Differential Games, p401-448 1973.

Descriptors: *Economic models, *Money, Game theory, Dynamic programming, Theorems.
Identifiers: *Fiat money, Macroeconomics, Microeconomics.

The purpose of the report is to provide satisfactory connections between current theories in macroeconomics and microeconomics. This study differs from the majority of past efforts in this direction because in a microeconomic context it focuses on money, credit, and financial institutions. From the point of view of monetary theory, the novelty lies in our efforts to connect individual economic behavior with the behavior of the economy as a whole and to apply mathematical models for this purpose. From the point of view of the more closely related mathematical literature on n-person games and competitive equilibrium analysis, the novelty lies in our efforts to explicitly consider money, credit, and financial institutions. The authors believe that an explicit treatment of money, credit, and financial institutions is necessary for forging links between macroeconomics and microeconomics.

AD-775 073/0GA PC$3.75/MF$1.45
Rand Corp Santa Monica Calif
RUBLE PRICE LEVELS AND DOLLAR-RUBLE RATIOS OF SOVIET MACHINERY IN THE 1960S,
Abraham S. Becker. Jan 73, 65p Rept no. R-1063-DDRE
Contract DAHC15-72-C-0083

Descriptors: *Commerce, *Machines, *USSR, International, Metalworking, Money, Value, Industries, Economics.
Identifiers: *Prices.

Evidence from Soviet sources bearing on the movement of the wholesale prices of machinery is assessed with a view to inferring crude price indexes. Official indexes, constructed for the 1960s from a limited sample and weighted by 1961 output values, show an almost monotonic decline of machinery and metal working (MMW) prices between 1960 and 1967 and rough stability in other branches. One-time price increases in a number of materials branches were instituted in the last half of 1967.

AD-775 186/0GA Reprint
Yale Univ New Haven Conn Cowles Foundation for Research in Economics
COMMODITY MONEY, OLIGOPOLY, CREDIT AND BANKRUPTCY IN A GENERAL EQUILIBRIUM MODEL,
Martin Shubik. 1972, 19p Rept no. Foundation Paper-391
Contract N00014-67-A-0097-0011
Availability: Pub. in Western Economic Jnl., v10 n4 p24-38 Dec 72.

Descriptors: *Economic models, Equilibrium(General), Game theory, Money.
Identifiers: *Oligopolies, Credit, Bankruptcy.

In the paper the author asks: Why is it that it is so easy to formulate a static symmetric noncooperative game as a representation of an open oligopolistic system; but it does not appear to be either easy or natural to formulate a static symmetric noncooperative game as a representation of a closed economic system. In the paper it is shown that the answer to this question is closely related to the role of money in an economy, and this in turn provides a link from statics to dynamics.

AD-775 247/0GA PC$3.00/MF$1.45
Stanford Univ Calif Operations Research House
DREWS INSTITUTIONALIZED DIVVY ECONOMY.
Technical rept.,
George B. Dantzig. Sep 73, 9p Rept no. TR-73-7
Contracts N00014-67-A-0112-0011, AT(04-3)-326
Sponsored in part by National Science Foundation Grant NSF-GP-31393.

Descriptors: *Economic models, Resources, Allocations, Consumers, Money, Theorems.
Identifiers: Consumer goods, Divvy economies, Prices, Resource allocation.

The paper is a simplified version of an economy considered by W. P. Drews, in which the sizes of the institutionalized consumer groups and the prices charged by other institutions controlling resources are manipulated by these institutions in an effort for each to achieve its share of the total money flows as agreed upon by the political process (for example by traditions and negotiations). This institutionalized view of the economy injects into the usual framework of technological relations an additional mechanism (which Drews calls the invisible band), the political process, which can arbitrarily set the proportions of total money flows to different institutions. The purpose is to show that once these are agreed upon, all other quantities, such as the levels of industrial production, prices of consumer goods and resources, and the sizes of consumer groups can be determined. Brouwer's Fixed-Point theorem is applied to prove the last statement. (Author)

COM-74-10483/GAsee prices of individual reports
International Customs Tariffs Bureau, Brussels (Belgium).
INTERNATIONAL CUSTOMS JOURNAL. YEAR 1973-1974.
Bulletins.
1973,74approx. 50 issues annually

The reports present authoritative information for exporters, importers, investors, manufacturers, and those concerned with international trade. They contain the schedules of duties and exemptions applicable to goods imported into or exported from the country. Order by individual numbers listed below:

Bull-006. Brazil. 9th ed, Jun 73, 255p, PC$6.50/MF$1.45, supersedes 9th ed, PB-173 303. **COM-74-10483-006**
Bull-080. Korea. 2nd ed, Oct 73, 266p, PC$6.50/MF$1.45, supersedes 2nd ed, PB-193 228 **COM-74-10483-080 COM-74-10483-080**
Bull-166. Australia. 10th ed, Sep 73, 348p, PC$7.50/MF$1.45, supersedes 10th ed, PB-176 394 **COM-74-10483-166 COM-74-10483-166**
Bull-190. Ireland. 10th ed, Aug 73, 881p PC$17.00/MF$1.45, supersedes 10th ed, COM-72-10249 **COM-74-10483-190 COM-74-10483-190**

COM-74-50189-01-02 (Order as COM-74-50189-01)
Marine Resources Development Foundation, San German, Puerto Rico.
A VERTICAL LONGLINE FOR RED SNAPPER FISHING,
David A. Olsen, Arthur E. Dammann, and Don Neal. 1974, 4p NOAA-74013106-2, MFR-Paper-1027
Also pub. as Puerto Rico Inter-National Underseas Lab. Contrib-0003.

Included in Marine Fisheries Review, v36 nl p7-9 Jan 74, COM-74-50189-01.

Descriptors: *Fishing, *Marine fishes, Fishing equipment, Effectiveness, Weight(Mass), Polypropylene, Buoys, Underwater equipment, Deep water.
Identifiers: *Lutjanus campechanus.

A method of fishing for red snappers and groupers has been presented which increases fishing effectiveness over electric reels by permitting the fisherman to work concentrations of these fishes more intensively. It is particularly effective in areas where predation upon caught fish prevents the use of the conventional bottom set longline. Use of vertical setlines permits the small boat to maintain mobility on the fishing grounds. The buoy serves as a point of reference for boat maneuvering since this fishery usually occurs in deep water away from accurate land marks.

PB-227 583/2GA PC$4.75/MF$1.45
Refractories Inst., Pittsburgh, Pa.
A STUDY OF THE REFRACTORIES INDUSTRY - ITS RELATIONSHIP TO THE U.S. ECONOMY AND ITS ENERGY NEEDS.
Final rept.,
Harry W. Barr, Jr., Ronald F. Ayers, W. Halder Fisher, Winston H. Duckworth, and Larry G. McCoy. 5 Oct 73, 137p* T.R.I.-100
Also pub. as Battelle Columbus Labs., Ohio. Rept. no. 249-F-7236.

Descriptors: *Industries, *Refractories, *Energy, *Fuel consumption, Economic analysis.

Refractories Industry (SIC 3255 and SIC 3297) of U.S. use of fuel (heat energy) is reported during 1972 based on independent mail survey. Volume use of Coal, Natural Gas, Propane, Distillate Oils, Residual Oils and Electricity are reported with dollar expenditure and BTU consumption. Relationship of refractories industry to national economy is reported and discussed via input/output model, Appendix A reports uses of refractories in major industries, Appendix B discusses input/output theory and its use in this research. Appendix C reports survey information developed (5 tables) (one figure - Distribution of refractories to end-use industries). Report states 'Refractories are critically important to the U.S. Economy' and 'every dollar of refractories output supported $1,266 worth of GNP (gross national product, the sum of goods and services produced in the economy) in the 1970 model.

PB-228 257/2GA PC$4.00/MF$1.45
Cornell Univ., Ithaca, N.Y. Cornell Energy Project.
POVERTY AND ECONOMIC GROWTH,
J. E. Hass, and G. Soutar. Mar 72, 19p Paper-72-9
NSF-RA/N-72-010
Grant NSF-GI-29903X
Report on National Energy Needs and Environmental Quality.

Descriptors: *Socioeconomic status, *Demographic surveys, *Economic analysis, Economic development, Growth, Inequalities, Income, Reference groups, Sociometrics, Regression analysis, Unemployment.
Identifiers: *Poverty.

A new measure of poverty, the 'real aggregate poverty gap',' is introduced in an analysis of the extent to which various subgroups in the society share in economic growth. Measuring growth as the increment in per capita real personal income, it appears that all subgroups have shared to some extent in the economic growth of the 1960's. While some groups share more than others, the conclusions call into question the arguments that some make regarding the need to limit economic growth: social pressures of income inequality may make that alternative infeasible. While economic growth is not a necessary condition for poverty reduction, it appears to be a sufficient condition.

PB-228 348/9GA PC$4.75/MF$1.45
National Academy of Sciences, Washington, D.C. Board on Science and Technology for International Development.
MEETING THE CHALLENGE OF INDUSTRIALIZATION: A FEASIBILITY STUDY FOR AN INTERNATIONAL INDUSTRIALIZATION INSTITUTE.
Aug 73, 145p*
Contract AID/csd-2584
Report of a Special International Panel of the Board on Science and Technology for International Development Office of the Foreign Secretary. Library of Congress Catalog Card no. 73-11740. Summary in Spanish and French.

Descriptors: *Economic development, *Industrial relations, *International relations, *Organizations, *Industrialization, Feasibility, Policies, Transfer of technology, Research, Project planning, Objectives, Developing countries.
Identifiers: *Institutes.

The report advances the concept of an independent, interdisciplinary research institute to illuminate new policy options confronting all nations. The study was made by an ad hoc advisory panel of the National Academy of Sciences, in consultation with leaders concerned with economic development from developed and developing countries. Appendices: (A) Illustrative research projects, (B) Terms of reference, (C) List of conferees.

PB-228 892/6GA PC$5.00/MF$1.45
Westat Research, Inc., Rockville, Md.
ABILITY TO AFFORD DECENT HOUSING.
Draft rept.,
John G. Yates, and Stephen K. Dietz. 4 Jun 73, 36p HUD-PDR-102

Descriptors: *Demographic surveys, *Residential buildings, *Socioeconomic status, Requirements, Attitudes, Statistical data, Income, Inequalities.
Identifiers: *Housing and urban development research, Substandard dwellings, Insufficient incomes.

The distribution and percent of the 50 million U.S. families in the United States that cannot afford decent housing is estimated and shown on maps of the U.S. The estimation procedure is based on a comparison of family income with the market value or rent of minimally decent housing units in about 200 market areas in 50 states x urban/rural x owner/renter. The analysis is based entirely on 1970 Census data and was conducted on a state-by state basis for owners and renters, for the urban and rural portions of each state. Results show a substantial variation in the percent of families that cannot afford minimal housing.

PB-228 899/1GA PC$4.50/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
BASIC SALES HOUSING ASSUMPTIONS.
Draft rept.
20 Jun 73, 30p HUD-PDR-436-b

Descriptors: *Residential buildings, *Sales, *Economic factors, Computer programming, Statistical data, Classifications, Financing, Prices, Expenses, Taxes, Savings, Leasing, Benefit cost analysis, Purchasing.
Identifiers: *Housing and urban development research, Mortgages, *Computer aided analysis.

A computer analysis is made of U.S. basic sales of housing and the economic factors involved.

PB-229 109/4GA PC$5.00/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
DIRECT FEDERAL LOANS AS A SUBSTITUTE FOR INTEREST RATE SUBSIDIES.
Final rept.,
John M. Guttentag. 26 Jun 73, 38p HUD-PDR-410

Descriptors: *Housing studies, *Subsidy programs, *Mortgages, *Low income groups, Financing costs, Cost reduction, Loans, Savings, Interest rates, Benefit cost analysis.
Identifiers: *Housing and urban development research.

The paper is directed to the question of whether replacement of the existing interest rate subsidy program by a direct loan program could reduce financing costs to the Government, and/or improve the efficiency with which housing services are delivered to low-income households.

PB-229 254/8GA PC$5.00/MF$1.45
Princeton Univ., N.J. Dept. of Economics.
THREE ESSAYS ON THE SUPPLY OF LABOR AND THE DEMAND FOR GOODS.
Final rept.,
James Joseph Heckman. 15 Jan 74, 153p DLMA-91-32-69-66-1
Contract DL-91-32-69-66

Descriptors: *Labor market, *Household relationships, *Economic models, Economic analysis, Supply(Economics), Wage levels, Human resources, Commodity markets, Equations, Economic statistics, Constraints, Time, Theses.

The report consists of three essays on household labor supply and market goods demand. The first considers the effect of exogenous and endogenous wage growth on the timing and level of life cycle labor supply, consumption, and saving decisions of households. Human capital theory and its assumptions are discussed within a dynamic context. Models of household labor supply based on static theory are interpreted within a life cycle dynamic context. The second essay considers the problem of estimating parameters of household labor supply and market goods demand equations which are consistent with the inequality restrictions of consumer theory. New functional forms for estimating such equations are proposed and contrasted with other functional forms. The third essay considers the impact of time restrictions on the parameter values of household demand and labor supply functions. Empirical implications of household time restrictions are developed for several models of the household.

PB-229 446/0GA PC$4.50/MF$1.45
Urban Systems Research and Engineering, Inc., Cambridge, Mass.
HOUSING AND FEDERAL TAXATION: COSTS AND EFFECTIVENESS.
Final rept.,
Anthony Blackburn. 19 Jun 73, 16p* HUD-PDR-316

Descriptors: *Housing market analysis, *Tax structure, Cost analysis, Real estate taxes, Legislation, Economic surveys, Tax incentives, Federal policies, Rental housing, Losses, Home ownership, Depreciation allowance, Subsidies, Tax exemptions, Urban development, Capital gains.
Identifiers: *Housing and urban development research.

The study discusses the wide variety of Federal tax laws and tax provisions which effect the housing market. Compilations of the models needed for this study were difficult, thereby limiting empirical data. Interrelationships are shown between the laws, owners, renters and various types of housing. Necessary tax shelters and deductions for the homeowners cause considerable drain on Federal revenues, as do incentives for construction and rehabilitation of rental housing. The impact of taxes on financial intermediaries is discussed in the remainder of the study.

PB-229 513/7GA PC$3.25/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
TAX REFORM AND TAX CREDITS.
Draft rept.,
Craig Stapelton. 22 Jun 73, 26p* HUD-PDR-413

Descriptors: *Tax structure, *Housing research, *Tax reform, Tax incentives, Tax credits, Substitutes, Reviews, Evaluation.
Identifiers: *Housing and urban development research.

The paper evaluates proposals to substitute various kinds of housing tax credits for the existing tax incentives. It highlights some of the advantages and disadvantages of this kind of reform.

TT-71-54026/1-2 PC$6.50
Department of Housing and Urban Development, Washington, D.C. Office of International Affairs.
PLANNED ECONOMY. VOLUME 24, NUMBERS 1-2, 1971.
1973, 254p
Trans. of Gospodarka Planowa (Poland) n1/2 p1-128 1971, by Wojciech Charabin and Halina Markiewicz. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Economic development, *Poland, Information systems, Computer programming, Training programs, Investments, Industrial growth, Industrial production, Economic models, Food consumption, Economic policy making, Foreign trade, Depreciation.
Identifiers: Planned economies.

Articles are presented on computerized information systems, a food consumption model, industrial transformation, female professional activities, investments, economic planning, foreign trade, production programming and growth, machine technology, technician training, principles of depreciation, and optimal decision making.

UCID-16378 PC$3.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
INDUSTRIAL MOVE TO SI AND THE LIVERMORE PLAN.
J. Pearson. Nov 73, 20p
Contract W-7405-eng-48

Descriptors: (*Industry, *Standardized terminology), Data, Standards.

For abstract, see NSA 29 05, number 12490.

5D. History, Law, and Political Science

AD-775 352/8GA PC$4.00/MF$1.45
Rand Corp Santa Monica Calif
NATO MILITARY POLICY: OBTAINING CONVENTIONAL COMPARABILITY WITH THE WARSAW PACT,
Steven L. Canby. Jun 73, 100p Rept no. R-1088-ARPA
Contract DAHC15-73-C-0181, ARPA Order-189-1

Descriptors: *NATO, *Western Europe, Policies, Military forces(Foreign), Military forces(United States), USSR.

Contents:
- Hypotheses explaining NATO's military deficiencies;
- The strategy of flexible response;
- The Soviet military quandary:
- An inferior resource base;
- The short versus long war problem;
- Force structure:
- Its relationship to strategy and specific deployment areas;
- Operating practices:
- Consistency and cost effectiveness.

AD-775 353/6GA PC$4.00/MF$1.45
Rand Corp Santa Monica Calif
IN SEARCH OF SELF-RELIANCE: U.S. SECURITY ASSISTANCE TO THE THIRD WORLD UNDER THE NIXON DOCTRINE,
Guy J. Pauker, Steven Canby, A. Ross Johnson, and William B. Quandt. Jun 73, 79p Rept no. R-1092-ARPA
Contract DAHC15-73-C-0181, ARPA Order-189-1

Descriptors: *Foreign aid, *Foreign policy, *United States government, National defense, Conflict, NATO, Military forces(Foreign), Military training, Counterinsurgency, Greece, Turkey, Indonesia, Korea.
Identifiers: *Military assistance, Developing countries.

The study examines the implications of the Nixon Doctrine for U.S. security-assistance programs in the Third World; the relevance to the Doctrine's implementation of the experiences of several Third World countries that have developed their own military doctrines and organizations; the military dimensions of security-assistance programs, particularly the advantages of force structures different from present ones; and the possibility of improving U.S. military relations with Third World countries through new strategies for training and materiel assistance.

AD-775 355/1GA PC$9.75/MF$1.45
Rand Corp Santa Monica Calif
CHINESE MILITARY AND POLITICAL LEADERS AND THE DISTRIBUTION OF POWER IN CHINA, 1956-1971,
W. W. Whitson. Jun 73, 493p Rept no. R-1091-DOS/ARPA
Contracts DAHC15-73-C-0181, SCC-1722-220025-010231

Descriptors: *China, *Leadership, *Political science, Military organizations.

The study focuses on alternative ways of defining Chinese interest groups, and on describing their behavior. It covers the period from 1956 to late 1971.

AD-775 482/3GA PC$4.50/MF$1.45
Army War Coll Carlisle Barracks Pa
ARE WE BACKING THE WRONG CAMEL. (SHOULD THE U. S. CHANGE ITS MIDEAST STRATEGY).
Student essay,
Richard B. Mosser. 7 Jan 71, 26p

Descriptors: *Middle East, *United States government, Political science, International relations, USSR, Israel.

The essay discusses what the military strategy for the United States in the Middle East should be. (Modified author abstract)

AD-775 484/9GA PC$4.00/MF$1.45
Army War Coll Carlisle Barracks Pa
BEARS IN THE MED.
Student essay,
Minter L. Wilson, Jr. 25 Oct 70, 17p

Descriptors: *USSR, *Mediterranean Sea, Power, Turkey, Iran, NATO, Middle East, Petroleum products, Oils.

The essay presents a brief study of the power position of the Soviets in the Mediterranean Sea area in the immediate past and the present. (Modified author abstract)

AD-775 485/6GA PC$4.75/MF$1.45
Army War Coll Carlisle Barracks Pa
BRAZIL THE LATENT GIANT HAS POTENTIAL STRENGTH.
Student essay,
Earl C. Sutherland. 10 Nov 70, 35p

Descriptors: *Brazil, Political science, Sociology, Economics, Food, Transportation.

The paper studies briefly the political, sociological and economic factors of Brazil, and considers a potential resource that could contribute to the rapid development of the country despite its many limitations.

AD-775 489/8GA PC$4.25/MF$1.45
Army War Coll Carlisle Barracks Pa
COMMUNISMO LATINO-POTPOURRI.
Student essay,
Walter R. Pierce, Jr. 1 Nov 70, 24p

Descriptors: *Communism, *Latin America, Economics, Political science, United States government.

The essay explores the status of communism in Latin America. Review of the history of communism in this strategic area of the world indicates its 40-odd year subversive offensive, while mutated to a degree, has caused considerable economic, ideological, and political upheaval. The essay concludes that the interests and national objectives of the United States in Latin America are daily being placed in deeper jeopardy by the current 'indifferent policy' we are pursuing, and that unless a dynamic, new US-Latin American Policy is not forthcoming in the immediate future, communism or a leftist derivative thereof will eventually prevail. (Author)

AD-775 490/6GA PC$4.00/MF$1.45
Army War Coll Carlisle Barracks Pa
CONFLICT AND CONSENSUS IN WORLD OCEAN AFFAIRS.
Student essay,
Harry L. Willard. 12 Oct 70, 17p

Descriptors: *Ocean bottom, *International law, Oceanography, Political science.

The purpose of the essay is to consider jurisdictional problems of the seabed and ocean floor beyond traditional limits of national concern. Ocean technology has suddenly triggered strong concern among nations to ensure themselves a share in the new-found source of natural wealth of the sea-bottom. Based on United Nations' progress with a treaty to outlaw nuclear weapons on the seabed, the essay concludes that this arms prohibition with its associated boundary agreement should pioneer the international task of assuring multiple use of the oceans, in line with a U.S.-proposed plan. (Author)

AD-775 491/4GA PC$4.00/MF$1.45
Army War Coll Carlisle Barracks Pa
THE INSURGENCY THREAT TO CASTRO'S REGIME.
Student essay,
Bruce E. Wallace. 11 Oct 70, 18p

Descriptors: *Political science, *Insurgency, *Cuba, Reviews.

Contents:
- The insurgency threat to Castro's regime;
- Fidel Castro;
- Cuban military forces;
- The Cuban economy;
- Insurgency groups.

AD-775 492/2GA PC$4.50/MF$1.45
Army War Coll Carlisle Barracks Pa
IS A REUNIFIED GERMANY THE ANSWER.
Student essay,
Robert J. Parr. 9 Nov 70, 28p

Descriptors: *West Germany, *East Germany, Attitudes(Psychology), USSR, Agreements, Eastern Europe, Western Europe.
Identifiers: *German reunification.

The essay considers the question of German reunification in view of national attitudes in Eastern and Western Europe with particular attention to current developments toward rapprochement. Different viewpoints and influences within Germany are examined and the relationship of the recent Soviet-German nonaggression pact is appraised. (Modified author abstract)

AD-775 495/5GA PC$4.00/MF$1.45
Army War Coll Carlisle Barracks Pa
NATIONALISM IN THE REPUBLIC OF THE PHILIPPINES.
Student essay,
Charles T. Mulvaney. 31 Dec 70, 20p

Descriptors: *Philippines, *Political science, International relations, Economics, United States government.

The study traces the history of nationalism and its influence on the lives of the Filipino people. Particular emphasis is given to the factors that shaped its development from 1898 to the present, especially where it relates to the Republic's economic and foreign relations vis-a-vis the United States. (Modified author abstract)

AD-775 496/3GA PC$4.75/MF$1.45
Army War Coll Carlisle Barracks Pa
NORDIC BALANCE: SWEDEN, A CASE STUDY.
Student essay,
Albert Leo Romaneski. 19 Oct 70, 35p

Descriptors: *Sweden, *Military forces(Foreign), Foreign policy, Stability.

A strategic appraisal of the Swedish Armed Forces is set against the background of other elements of national power. Although Sweden is a small country, the analysis leads to the conclusion that the strength of the Swedish Armed Forces contributes significantly to the military balance of the Scandinavian region. Situated between the major power blocs represented by NATO and the Warsaw Pact countries, Sweden pursues an alliance-free foreign policy which also enhances regional military/political stability, termed 'Nordic Balance'. (Modified author abstract)

AD-775 498/9GA PC$4.75/MF$1.45
Army War Coll Carlisle Barracks Pa
PANAMA LINK OR ROADBLOCK TO HEMISPHERE SECURITY.
Student essay,
Charles Sovern. 19 Oct 70, 33p

Descriptors: *Panama, Political science, Sociology, Economics, International relations, United States government.

The purpose of the essay is to review the sociological, economic, political and national objectives which have shaped Panama and to analyze current forces and trends as they affect relationships with the U.S. and U.S. national security. (Modified author abstract)

AD-775 511/9GA PC$4.75/MF$1.45
Army War Coll Carlisle Barracks Pa
THE PERSIAN GULF: WHAT IS AT STAKE.
Student essay,
George Stukhart, Jr. 30 Sep 70, 31p

Descriptors: *Middle East, *Oils, *Petroleum products, Conflict, USSR.
Identifiers: Persian Gulf.

The Persian Gulf area is at the heart of the Middle East problem, a region of vital interest to the Free World, yet one of primary concern to the USSR. The interests of the United States and its objectives in the gulf vis-a-vis the Soviet Union are a matter of increasing concern for the future and are analyzed in the study.

AD-775 512/7GA PC$4.25/MF$1.45
Army War Coll Carlisle Barracks Pa
A POSITIVE NATIONAL PURPOSE.
Student essay,
Sam H. Smith. 19 Nov 70, 22p

Descriptors: *Political science, Reviews.

The Purpose of the essay is to develop a statement of the National Purpose of the United States. (Modified author abstract)

AD-775 513/5GA PC$4.75/MF$1.45
Army War Coll Carlisle Barracks Pa
THE PROSPECTS FOR THAILAND, CAMBODIA AND LAOS TO RESIST PEKING-HANOI COMMUNIST DOMINATION IN THE 1970'S.
Student essay,
John F. Roehm, Jr. 23 Dec 70, 31p

Descriptors: *Thailand, *Cambodia, *Laos, *Foreign policy, China, Communism, Insurgency, United States government.

The purpose of the essay is to examine the future of Thailand, Cambodia and Laos and to assess the potential of these three key Southeast Asian mainland nations to remain viable and free from Peking-Hanoi domination in the 1970's.

AD-775 571/3GA PC$5.00/MF$1.45
Army War Coll Carlisle Barracks Pa
THE ROLE OF UNITED STATES ASSISTANCE PROGRAMS IN DEVELOPING INDIGENOUS LEADERSHIP IN EAST AFRICA.
Student essay,
Richard A. Penkava. 15 Jan 71, 36p

Descriptors: *United States government, *Foreign aid, *Africa, Education, Leadership.
Identifiers: Military assistance, Developing countries.

The paper discusses and evaluates the role of several education and technical assistance programs enacted by the United States to assist underdeveloped countries, and in this are East African nations, in furthering the development of indigenous leadership. (Modified author abstract)

AD-775 572/1GA PC$4.00/MF$1.45
Army War Coll Carlisle Barracks Pa
THE STRATEGY OF MASSIVE RETALIATION IN THE SEVENTIES.
Student essay,
Jack C. Randles. 7 Nov 70, 20p

Descriptors: *Political science, *United States government, National defense, Foreign policy.

The purpose of the essay is to examine the feasibility of the nation adopting the strategy of massive retaliation as its principal defensive strategy for the 1970's. A comparison is made between the conditions and circumstances of the 1950's and the 1970's. (Modified author abstract)

AD-775 574/7GA PC$4.00/MF$1.45
Army War Coll Carlisle Barracks Pa
U. S. MILITARY GOVERNMENT IN JAPAN, 1945-1950.
Student essay,
John W. Roberts, Jr. 6 Nov 70, 16p

Descriptors: *Japan, *United States government, Warfare, International relations, Korea.
Identifiers: World War 2.

The essay examines the U. S. occupation of Japan for the five years between World War II and the Korean War. This period re-shaped U. S. - Japanese relations during the last twenty years from one of enemy to ally and is responsible for the present cooperation between the two nations. Future relations will still be effected by this period as long as Japan's Constitution exist in its present form and as long as Japan's economy is so closely associated with the U. S. economy. (Author)

AD-775 575/4GA PC$4.25/MF$1.45
Army War Coll Carlisle Barracks Pa
VIETNAM PULL-OUT, THEN WHAT.
Student essay,
John P. Ransom. 21 Oct 70, 23p

Descriptors: *Limited war, *Vietnam, Military forces(United States), Reduction, Reviews, Political science.

The vocal and violent expression by various segments of the American public for a Vietnam pull-out prompted this essay as an examination of the effect of a precipitate pull-out and as a search for an alternate Pacific Region strategic policy for the United States. (Modified author abstract)

AD-775 579/6GA PC$4.25/MF$1.45
Army War Coll Carlisle Barracks Pa
WILL THE NIXON DOCTRINE WORK IN THAILAND.
Student essay,
Roger M. Pezzelle. 8 Nov 70, 23p

Descriptors: *Thailand, *United States government, *Foreign policy, Reviews.

The essay examines whether or not the Nixon Doctrine will work in Thailand. Thailand is faced with a growing Maoist insurgency, and the threat of Communist proxy invasion from Laos and Cambodia. In this environment Thailand seeks economic growth, social progress, and expanded democracy while struggling with her security and calculating the Asian power structure. (Modified author abstract)

COM-74-50161/0GA Not available NTIS
National Bureau of Standards, Washington, D.C.
EUREKA.
Final rept.,
Klaus D. Mielenz. 1974, 2p
Pub. in Applied Optics, v13 n2 pA14 and A16 Feb 74.

Descriptors: *Warships, *Strategic weapons, *Mirrors, Unconventional warfare, Solar energy, Focusing.
Identifiers: *Second Punic War.

In view of the recently renewed controversy whether Archimedes could have used mirrors to defer the attacking Roman fleet during the siege of Syracuse in the Second Punic War, it is pointed out that the feasibility of this has been demonstrated by Buffon in 1747. Additional facts are presented which also suggest that the use of burning mirrors could have presented a serious threat to the blockading Romans.

PB-228 881/9GA PC$3.00/MF$1.45
Kansas City Police Dept., Mo.
ALERT II. A CRIMINAL JUSTICE INFORMATION SYSTEM.
1974, 21p*

Descriptors: *Information systems, *Law enforcement, *Criminal justice, Police, Criminal investigations, Courts, Local government, Public administration, Missouri.
Identifiers: ALERT 2 information system, Kansas City(Missouri).

The booklet briefly describes Alert II - a regional criminal justice information system designed and

operated by the Kansas City, Missouri Police Department. The overall system is made up of subsystems that can be grouped into the three areas of law enforcement, adjudications, and corrections. The Law enforcement subsystem provides users with information pertaining to wanted persons and autos, as well as warning information on potentially dangerous individuals. Court personnel can request information which will expedite the workload of the court and aid in decision making. The probation department on-line system furnishes case status information and allows for entry of pre-sentence recommendations to judges.

5E. Human Factors Engineering

AD-775 011/9GA PC$12.50/MF$1.45
Naval Postgraduate School Monterey Calif
HUMAN FACTORS IN DESTROYER OPERATIONS.
Master's thesis,
Russell Lee Madison. Mar 74, 186p

Descriptors: *Human factors engineering, *Destroyers, Performance(Human), Motivation, Vigilance, Searching, Detection, Environments, Stress(Psychology), Shipboard, Theses.

A study was made of human factors affecting operations of U.S. Navy destroyers. Shipboard duties were analyzed to determine factors relevant to job performance. Topics included vigilance and motivation; search techniques; sensor optimization; man's total environment (factors such as fatigue, stress, lighting, temperature, noise, medication, and smoking); group and individual psychological needs; human engineering requirements; and typical performance effectiveness criteria. (Modified author abstract)

AD-775 430/2GA PC$4.00/MF$1.45
Army Construction Engineering Research Lab Champaign Ill
EMPLOYEE-ATTITUDE AND OFFICE ENVIRONMENT ANALYSES FOR THE DEVELOPMENT OF HUMAN AND ARCHITECTURAL REQUIREMENTS FOR THE BUFFALO DISTRICT OFFICE, BUFFALO, N.Y. BUFFALO OFFICE STUDY PART I.
Final rept.,
Wes Gibbs, Jr.. Feb 74, 95p Rept no. CERL-TR-D-17

Descriptors: *Attitudes(Psychology), *Human factors engineering, Environments, Architecture, Questionnaires, Assessment, Personnel.
Identifiers: Organizational climate.

The report presents Part I of an evaluation of 143 office employees' attitudes toward their work-area environments and an assessment of their office resource, facility, and service requirements. The study was conducted during July-October 1973 at the Buffalo District Office of the U.S. Army Corps of Engineers, Buffalo, N.Y. The measurement techniques of three analyses to determine the human and architectural requirements of an office environment were demonstrated, and the results of the analyses were documented for an Architectural Requirement Manual (Part II) for the design of the Buffalo District Office Environment. (Author)

COO-1469-235 PC$9.75/MF$1.45
Illinois Univ., Urbana (Usa). Dept. Of Computer Science.
PENETRON LAND COLOR DISPLAY SYSTEM (PENTECOST) AND SOME OBSERVATIONS CONCERNING COLOR PERCEPTION.
G. Panigrahi. Oct 73, 151p UIUCDCS-R-73-583
Contract AT(11-1)-1469

Descriptors: (*Cathode ray tubes, Color), (*Color, *Vision), (*Display devices, *Television), Man, Specifications.

For abstract, see NSA 29 05, number 12448.

5G. Linguistics

AD-774 799/1GA PC$6.00/MF$1.45
Haskins Labs New Haven Conn
SPEECH RESEARCH: A REPORT ON THE STATUS AND PROGRESS OF STUDIES ON THE NATURE OF SPEECH, INSTRUMENTATION FOR ITS INVESTIGATION, AND PRACTICAL APPLICATIONS.
Status rept. 1 Jul-31 Dec 73,
Franklin S. Cooper. Jan 74, 243p Rept no. SR-35/36-1973
Contract N00014-67-A-0129-0001, Grant PHS-DE-01774
Includes Cumulative Index for SR-29/30 (Jan-Jun 72)-SR-35/36 (Jul-Dec 73). See also report dated Aug 73, AD-766 178.

Descriptors: *Speech, *Phonology, Linguistics, Phonetics, Speech recognition, Auditory perception, Visual perception, Learning, Hearing, Deafness, Blindness, Throat, Electromyography, Reading machines, Reaction time.
Identifiers: *Speech articulation.

Contents: Motor organization of some speech gestures; Effect of speaking rate on labial consonant-vowel articulation; Stress and syllable duration change; Parallel processing of auditory and phonetic information in speech perception; Parallel processing of auditory and phonetic information in speech perception; Perception of speech and nonspeech; Identification of place and voicing features in synthetic stop consonants; Lag effect in dichotic speech perception; Language processing and the hearing-impaired child; Audible outputs of reading machines for the blind; Hemispheric asymmetry in visual processing of linguistic items; Levels of processing in speech perception--neurophysiological and information-processing analyses.

AD-774 961/7GA Reprint
Harvard Univ Cambridge Mass Psycho-Acoustic Lab
LANGUAGE AND COMMUNICATION,
George A. Miller. 1951, 3p Rept no. PNR-100
Contract N5ori-76
Availability: Pub. in Psychological Book Previews, v1 n4 p85-86 Oct 51.

Descriptors: *Voice communications, *Psychology, Textbooks, Reviews.
Identifiers: *Psycholinguistics.

This book is a text for undergraduate and graduate courses in the psychology of communication. The subject is a broad one and a serious effort was made to cover all the aspects of particular concern to psychologists. The order in which the subject matter is introduced runs from the detailed facts of phonetics and perception to the molar, social aspects of communication within groups. The basic ideas of the theory of information are used to give continuity to the development.

AD-774 985/6GA PC$3.25/MF$1.45
Bolt Beranek and Newman Inc Cambridge Mass
CONTROL CONCEPTS IN A SPEECH UNDERSTANDING SYSTEM,
Paul D. Rovner, Bonnie L. Nash-Webber, and William A. Woods. Dec 73, 26p Rept nos. BBN-2703, AI-9
Contract DAHC15-71-C-0088, ARPA Order-1697

Descriptors: *Speech recognition, *Artificial intelligence, Computational linguistics, Phonology, Speech, Intelligibility, Sound, Automatic.
Identifiers: SPEECHLIS system, Phonemes.

Automatic speech understanding must accommodate the fact that an entirely accurate and precise acoustic transcription of speech is unattainable. By applying knowledge about the phonology, syntax, and semantics of a language and the constraints imposed by a task domain, much of the ambiguity in an attainable transcription can be resolved. This paper deals with how to control the application of such knowledge. A control framework is presented in which hypotheses about the meaning of an utterance are automatically formed and evaluated to arrive at an acceptable interpretation of the utterance. This design is currently undergoing computer implementation as a part of the BBN Speech Understanding System (SPEECHLIS). (Author)

AD-775 160/5GA PC$5.00/MF$1.45
Latsec Inc La Jolla Calif
MACHINE-AIDED EDITING.
Final rept. 1 Jun 72-30 Jun 73,
Peter P. Toma, Jerry A. Carlson, David R. Stoughton, and Joann P. Ryan. Dec 73, 161p*
RADC-TR-73-368
Contract F30602-72-C-0316

Descriptors: *Machine translation, *Editing, *Computer applications, *Russian language, Feasibility studies, Display systems, Man machine systems.
Identifiers: *Machine aided editing, SYSTRAN system, *Computer aided editing, *Computer aided typesetting.

The three main parts of this report deal with developing post-editing aids for SYSTRAN output. The first describes the implementation of a computer-aided post-editing system which allows the editor to display simultaneously on a CRT a Russian input sentence and the corresponding English output, plus some context. The editor can perform such functions as deletions, insertions, rearrangements, etc., via simple key-board operations. Several specific recommendations are given for optimization of this system. The second discusses how editing functions might best be carried out on video editing terminals in conjunction with a computerized typesetting system. Various criteria for choosing a typesetter are considered. The investigator concludes that a Photon Pacesetter Mark II would best serve the future needs of the Technical Translation Division at Wright-Patterson AFB. The third discusses the feasibility of automatically flagging SYSTRAN output through application of English 'well-formedness criteria.' Included is a survey of the distribution in English of adnominal genitive constructions, compound nouns, and possessive-noun plus noun constructions and an illustration of how the findings of this survey might be applied to improve the English output of Russian adnominal genitive structures. (Modified author abstract)

AD-775 545/7GA PC$7.25/MF$1.45
Massachusetts Inst of Tech Cambridge Project Mac
A NEW GRAMMATICAL TRANSFORMATION INTO DETERMINISTIC TOP-DOWN FORM,
Michael M. Hammer. Feb 74, 302p Rept no. MAC-TR-119
Contract N00014-70-A-0362-0001, Grant NSF-GJ-34671

Descriptors: *Transformational grammars, Syntax, Theses, Compilers, Set theory, Programming languages.
Identifiers: *Parsing, MAC project.

Although deterministic top-down parsing is an attractive parsing technique, the grammars to which it is applicable (the LL(k) grammars) are but a small subset of the LR(k) grammars, those that can be parsed deterministically bottom-up. In this thesis, the problem of transforming LR(k) grammars into equivalent LL(k) grammars is studied. A new transformation procedure is devised which is more powerful than currently available techniques and which preserves the compiling ability of the grammar. (Author)

5H. Man-Machine Relations

AD-774 987/2GA PC$3.25/MF$1.45
California Univ Irvine

BIOCYBERNETICS: AN INTERACTIVE MAN-MACHINE INTERFACE.
Annual technical rept. 1 Jan-31 Dec 73,
R. F. Thompson, and T. J. Taylor. 20 Feb 74, 45p
Contract DAHC15-72-C-0121, ARPA Order-1001
See also AD-756 701 and AD-764 106.

Descriptors: *Man machine systems, *Cybernetics, *Training, Computer applications, Stimulation(Physiology), Interfaces, Response, Symbols, Communication terminals, Feasibility studies, Feedback, Electrophysiology, Muscles.
Identifiers: *Biocybernetics, Automatic control, Reinforcement(Psychology), Alphanumeric symbols, Cognitive stimuli.

The research reported involves the detection of human bioelectric phenomena that have been made analogues of ongoing cognitive processes and the utilization of these phenomena to control and/or communicate with external devices. The technique is applicable to situations requiring rapid human intervention in the control of complex systems operation. The major advantage of this project is the virtually automatic control of systems by the trained subject.

51. Personnel Selection, Training, and Evaluation

AD-774 853/6GA PC$7.00/MF$1.45
Human Resources Research Organization Alexandria Va
RETENTION OF FLYING SKILLS AND REFRESHER TRAINING REQUIREMENTS: EFFECTS OF NONFLYING AND PROFICIENCY FLYING.
Final rept.,
Robert H. Wright. Dec 73, 77p Rept no. HUMRRO-TR-73-32
Contract DAHC19-73-C-0004

Descriptors: *Army personnel, *Pilots, *Flight training, Proficiency, Skills, Transfer of training, Questionnaires.

A questionnaire survey was conducted of Army aviators who had experienced extended periods of nonflying or of flying only the minimum number of hours required by Army regulations to maintain proficiency, in order to determine the loss of flying ability experienced and the refresher training required for combat readiness. Analysis of the data obtained indicated that flight excusal followed by refresher training would provide operational units with better qualified aviators at less cost than the traditional flying program. A proficiency maintenance program based on very low-cost synthetic training devices seems to be the only alternative that might be less costly than excusal plus refresher training, but feasibility of these devices in the Army context is unknown at this time. (Author)

AD-774 882/5GA PC$3.25/MF$1.45
Office of Civilian Manpower Management (Navy) Arlington Va
APPLICATION OF CIVILIAN MANPOWER MODELS TO THE NAVAL FACILITIES ENGINEERING COMMAND.
Research rept.,
M. Gewirtz, S. Korn, and R. J. Niehaus. Jan 74, 29p Rept no. OCMM-RR-16

Descriptors: *Manpower, *Naval personnel, *Personnel management, Finance, Budgets, Mathematical models.

The report is the result of a joint endeavor between the Naval Facilities Engineering Command (NAVFAC) and the U. S. Navy Office of Civilian Manpower Management. The intent of the study was to determine the applicability of various manpower models developed by OCMM to the management requirements of NAVFAC. This is the initial large-scale application of the models to command level problems of ceiling and budget control. Two numerical examples of the OCMM Recruiting Requirements Model (ORRM) are discussed. The first is an application of the average grade version of the model to NAVFAC. The second is the initial results from a model to assist the headquarters manager in testing ceiling and budget tradeoffs across multiple field activities. In the latter case individual manpower models for each of the field activities are linked by common ceiling constraints. (Author)

AD-774 901/3GA PC$3.25/MF$1.45
Naval Electronics Lab Center San Diego Calif
A CAREER PLANNING PROGRAM.
Technical document,
R. A. Hamilton. 8 Jan 74, 47p* Rept no. NELC-TD-299

Descriptors: *Personnel development, *Planning, Assessment, Counseling, Data acquisition, Training, Employment, Mobility, Organizations, Job satisfaction, Motivation, Adaptation.
Identifiers: *Career development, Project planning.

Career planning is defined as a means for an employee to answer the questions, where am I going and how do I get there, and for an organization to capitalize on its most valuable resource, its people. The effectiveness of the organization is shown to depend on the career satisfaction of its employees. Career planning activities in organizations other than NELC are studied, and a career planning program for the Center is recommended. The approach is to develop the employee's strength, skills, and understanding of realistic options so that he will readily adapt to new career demands and opportunities. It calls for the establishment of a career planning-motivation program at the Center and a full-time planning position. (Author)

AD-774 919/5GA PC$3.25/MF$1.45
Navy Personnel Research and Development Center San Diego Calif
SURVEY OF UNIT PERFORMANCE EFFECTIVENESS MEASURES.
Preliminary rept. Jan-Jun 73,
Orvin A. Larson, Stephen I. Sander, and John H. Steinemann. Jan 74, 37p Rept no. NPRDC-TR-74-11

Descriptors: *Marine Corps personnel, *Combat readiness, *Military training, *Performance(Human), Efficiency, Assessment, State of the art, Reviews, Decision making, Military research.

Improved measures of performance effectiveness are required by the Marine Corps for its combat unit training program in order to ensure the maintenance of appropriate levels of unit readiness in accordance with its assigned mission. A survey to determine the state-of-the-art of performance assessment systems and methodologies was conducted as an initial research phase in support of this requirement. A two-fold effort was made to review the research literature in performance evaluation, decision making, and unit training, and to gather first-hand information about existing performance assessment systems. A broad informational survey provides a number of alternative theoretical and practical methodologies which may serve as feasible approaches in ensuing research. (Author)

AD-774 929/4GA PC$3.00/MF$1.45
California State Univ San Diego Dept of Psychology
ADVANCED COMPUTER-BASED INSTRUCTION--PROJECT CAMELOT: PRELIMINARY REPORT ON A CAI SYSTEM.
Quarterly technical rept. 1 Oct-31 Dec 73,
Lynn H. Brock, and Frederick Wm. Hornbeck. 21 Feb 74, 25p
Contract N61339-73-C-0184, ARPA Order-2311

Descriptors: *Programmed instruction, *Naval training, Computer applications, Programming languages, Graphics, Display systems, Scientific research.
Identifiers: CAMELOT computer program, *Computer aided instruction, Grail programming language.

CAMELOT is a computer-assisted instructional system designed to support computer-generated graphics, computer-generated vocalizations, and computer-selected slide projection as well as full ASCII alphanumeric code. This report consists of a description of the concepts and facilities of CAMELOT, a description of the hardware configuration under development for the Naval Personnel Research and Development Center, San Diego (NPRDC), and the external specifications of the author language GRAIL (GRaphics Assisted Instructional Language). (Modified author abstract)

AD-774 931/0GA PC$9.25/MF$1.45
IBM Federal Systems Div Cape Canaveral Fla Cape Kennedy Facility
DESIGN OF TRAINING SYSTEMS, PHASE 1 REPORT. VOLUME 1.
Final rept.,
Harold J. Bellamy, Lawrence R. Duffy, Albert Elkin, Robert E. Hallman, and Ronald E. Yanko. Dec 73, 464p Rept no. IBM-FSD-ESC-73-535-005 TAEG-12-1-Vol-1
Contract N61339-73-C-0097
See also Volume 2, AD-774 932.

Descriptors: *Naval training, Mathematical models, Management, Computerized simulation.
Identifiers: NETS(Naval Education and Training System), Naval education and training system.

The report presents a functional descriptive model of the current Naval Education and Training System and idealized concepts oriented toward a 1980 time frame. While technological gaps and problem areas are presented, no organizational elements are specified, since the prime areas of interest are the functions performed. In addition, the rationale for selection of candidate mathematical models to be developed in Phase II is given. Strategic working assumptions for the 1980's are presented in Volume 2 of this report. (Modified author abstract)

AD-774 932/8GA PC$5.75/MF$1.45
IBM Federal Systems Div Cape Canaveral Fla Cape Kennedy Facility
DESIGN OF TRAINING SYSTEMS, PHASE 1 REPORT. VOLUME 2. APPENDICES.
Final rept.,
Harold J. Bellamy, Lawrence R. Duffy, Albert Elkin, Robert E. Hallman, and Ronald E. Yanko. Dec 73, 221p Rept no. IBM-FSD-ESC-73-535-004 TAEG-12-1-Vol-2
Contract N61339-73-C-0097
See also Volume 1, AD-774 931.

Descriptors: *Naval training, Mathematical models, Management, Computerized simulation.
Identifiers: NETS(Naval Education and Training System), Naval education and training system.

Contents:
Strategic assumptions;
Mathematical models and data bases operational within the Naval education and training command;
Bibliography.

AD-774 944/3GA PC$4.25/MF$1.45
Naval Personnel Program Support Activity Washington D C Personnel Research Lab
SURVEY OF JUNIOR OFFICER RETENTION: I. WHY USN OFFICERS RESIGN FROM THE NAVY,
Victor Fields. May 65, 22p
See also Volume 2, AD-774 945.

Descriptors: *Naval personnel, *Surveys, Officer personnel, Retention(General), Public opinion.

Questionnaire responses of 93 USN officers in categories 1100, 1310, and 1350, were analyzed to answer why USN officers resign from the Navy. The respondents were mostly Lieutenants (60%), graduates of the NROTC (Regular) Program (67%), in the 1100 category (86%), married (72%), and 26-29 years of age (73%). Recalling their Navy career interest at various times, they reported a sharp drop in interest after two years of active duty. Half of them (48%) indicated that benefits of subsidized education caused them to enter the Navy. A desire for education is further supported by the fact that only 44% expected employment on separation and 40% expected to attend school full or part time. Evaluating their potential for future income, 77% thought they would be ahead in civilian life in the long run.

AD-774 945/0GA PC$4.50/MF$1.45
Naval Personnel Program Support Activity Washington D C Personnel Research Lab
SURVEY OF JUNIOR OFFICER RETENTION: II. WHY SOME USNR OFFICERS LEAVE THE NAVY AND SOME STAY,
Victor Fields. 1965, 28p
See also Volume 1 dated May 65, AD-774 944 and Volume 3 dated Jun 65, AD-774 946.

Descriptors: *Military reserves, *Naval personnel, Retention(General), Officer personnel, Surveys, Public opinion.

The purpose of the Junior Officer Retention Survey was to assess the reasons why USNR officers request release from active duty at the end of their obligated service and why USNR officers request transfer to the regular Navy. Both the leavers and stayers were chiefly college graduates but a greater percentage of the leavers than the stayers had graduate education and degrees. A greater percentage of the stayers reported Navy training since commissioning, more sea duty, a greater amount of active duty, and a greater number of extensions. Recalled interest in a Navy career shows a progressive decline among the leavers and a progressive increase among the stayers.

AD-774 946/8GA PC$4.00/MF$1.45
Naval Personnel Program Support Activity Washington D C Personnel Research Lab
SURVEY OF JUNIOR OFFICER RETENTION: III. WHY SOME USNR OFFICERS REQUEST VOLUNTARY RECALL TO ACTIVE DUTY,
Emanuel P. Somer. Jun 65, 17p
See also Volume 1, AD-774 944 and Volume 2, AD-774 945.

Descriptors: *Military reserves, *Naval personnel, Retention(General), Officer personnel, Surveys, Public opinion.

The purpose of the Junior Officer Retention survey was to assess some of the reasons why USNR officers request voluntary recall to active duty. There were 46 officers in the sample with 1105, 1315, and 1355 designators. Three-fourths were Lieutenants and the remaining were Lieutenants (junior grade). These officers had generally been away from active duty about one year or less (67%), almost half (43%) were OCS graduates, 85% were college graduates, and most of them (78%) were in the 26-29 age group. Their main reasons for having applied for a commission were a desire for a position of prestige and responsibility, a liking for ships and the sea, and wanting to fly airplanes. The two main reasons for leaving active duty had been the desire to continue their education and to do the professional work for which they had been trained.

AD-774 999/7GA PC$4.00/MF$1.45
Human Resources Research Organization Alexandria Va
THE U.S. COAST GUARD ACADEMY CURRICULA: AN EVALUATION.
Technical rept.,
Theodore R. Powers, James A. Caviness, T. O. Jacobs, and Jeffrey Maxey. Feb 74, 94p Rept no. HumRRO-TR-74-2
Contract DOT-CG-22532-A

Descriptors: *Courses(Education), *Training, *Coast Guard, Education, Students, Interviewing.
Identifiers: Evaluation.

The report presents the results of research that had as its objective the evaluation of the curricula of the U.S. Coast Guard Academy. Over 125 Coast Guard officers and men were interviewed, to gather detailed background information about the Coast Guard, the Coast Guard Academy, and job requirements of Academy graduates. These data were developed into a Job-Task Inventory Questionnaire (JTIQ) which was administered to Academy graduates, and yielded information as to the critical tasks required of officers during their early years of Coast Guard service. The JTIQ responses and two CG-developed documents were ('A Study to Determine the Future Commissioned Officer Requirements of the CG-1972-1982' and the 'Long Range View' paper) were analyzed and, through standard systems analytic procedures, recommendations for changes to the Academy curricula were developed.

AD-775 012/8GA PC$6.50/MF$1.45
Naval Postgraduate School Monterey Calif
MANAGEMENT EDUCATION: AN EXPERIMENTAL COURSE.
Master's thesis,
Paul Payne Gutelius. Mar 74, 68p

Descriptors: *Management training, *Programmed instruction, *Teaching methods, Reading, Field conditions, Computer applications, Game theory, Adaptive systems, Motivation, Theory, Theses.
Identifiers: Student options.

The thesis describes the design, implementation, and evaluation of a course in the theory and practice of management. It gives an appraisal of programmed learning techniques and compares three methods of teaching management – by readings, by cases, and by computer gaming. Additionally, it relates student reactions to the opportunity to select one of the three methods. (Modified author abstract)

AD-775 043/3GA PC$14.25/MF$1.45
Air Force Human Resources Lab Brooks AFB Tex
AN EXAMINATION OF SOME BEHAVIORAL CORRELATES OF AIR FORCE UNDERGRADUATE PILOT TRAINING THROUGH THE USE OF THE PORTER AND LAWLER PERFORMANCE/SATISFACTION MODEL.
Final rept. Jan-Jun 73,
David Peter Lohmann. Feb 74, 221p Rept no. AFHRL-TR-73-67

Descriptors: *Pilots, *Training, Performance(Human), Behavior, Correlation techniques, Statistical tests, Analysis of variance.
Identifiers: *Pilot training.

The study tested the applicability of portions of the Porter and Lawler model in a cognitive training environment and to examine the relationships among some behavioral variables in Air Force Undergraduate Pilot Training. The variables analyzed were the Maslow need hierarchy, effort, abilities, role perceptions, performance, satisfaction and the propensity to leave the organization. The statistical procedures employed were multivariate regression analysis with binary variables using backward F tests, Student t tests, correlation analysis, two way analysis of variance, the Fisher r to Z transformation and the non parametric chi squared goodness of fit test. The findings of the research support the Porter and Lawler model at the component level, but do not support the use of the Porter and Lawler model in a cognitive training environment to explain performance. (Modified author abstract)

AD-775 047/4GA PC$3.25/MF$1.45
Air Force Human Resources Lab Brooks AFB Tex
AN ANALYSIS OF AIR FORCE READING IMPROVEMENT PROGRAMS. RESULTS OF USAF SURVEY NUMBER 73-89.
Interim technical rept. Mar-Sep 73,
William P. Mockovak. Jan 74, 26p Rept no. AFHRL-TR-73-54

Descriptors: *Air force personnel, *Education, *Reading, Skills, Questionnaires, Assessment.

The report summarizes the results of a questionnaire that was sent to the education offices of 93 Air Force bases in the continental United States. The purpose of the questionnaire was to obtain objective information concerning the present status of Air Force reading improvement programs in an effort to obtain better insight into the type and degree of reading problems facing the Air Force. The information presented in this paper attempts to answer such questions as, how many airmen participate in reading improvement programs, what career fields have a significant number of low-ability readers, what reading programs are available at different bases, what are the major reading problems encountered by Air Force personnel, and who has the responsibility for organizing and financing the reading programs. Finally, recommendations concerning the Air Force's reading improvement programs are also discussed. (Author)

AD-775 048/2GA PC$3.00/MF$1.45
Air Force Human Resources Lab Brooks AFB Tex
COMPARABILITY STUDY OF ARMED SERVICES VOCATIONAL APTITUDE BATTERY SCORES FROM ANSWER SHEET AND ANSWER CARD ADMINISTRATION.
Final rept.,
Lonnie D. Valentine, Jr., and Douglas K. Cowan. Jan 74, 16p Rept no. AFHRL-TR-73-55

Descriptors: *Aptitude tests, Statistical analysis.
Identifiers: *Armed Services Vocational Aptitude Battery.

Armed Services Vocational Aptitude Battery (ASVAB) Form 2 was standardized for Digitek answer sheets. In September 1973, the Digitek scoring facility at Randolph AFB will be inadequate to handle anticipated scoring load. Consequently, ASVAB answer forms have been redesigned for processing via a Hewlett-Packard mark-sense reader from IBM card size forms which are more compressed than was the Digitek form. Score comparability from administrations on the two answer forms was investigated. It was found that the answer form change had negligible effect on average examinee performance overall score distributions, or correlations among the battery's tests. Significant interaction between initial ability (as measured by the AFQT) and answer form used was found for two tests (Word Knowledge and Coding Speed); however, the interaction did not follow a clearcut pattern. It was recommended that existing ASVAB conversion tables continue in use until completion of a full restandardization study. (Author)

AD-775 049/0GA PC$3.25/MF$1.45
Air Force Human Resources Lab Brooks AFB Tex
PRELIMINARY EVALUATION OF THE EFFECTIVENESS OF AIR FORCE ADVERTISING.
Technical rept.,
Bart M. Vitola, Cecil J. Mullins, John D. Williams, and Alan E. Michelson. Jan 74, 47p Rept no. AFHRL-TR-73-62

Descriptors: *Air Force personnel, *Recruiting, Questionnaires, Motivation, Males, Females, Statistical analysis, Assessment.
Identifiers: Advertising.

The Airman Enlistment Questionnaire was administered to a sample of non prior-service enlistees, 1,667 males and 300 females. Analysis of the responses shows: Educational opportunity is the strongest motivator for enlisting in the Air Force; there is an indication that Air Force advertising should make different appeals to men and women; and Air Force radio programs are not reaching a large number of the desired population. Relationships between these and other variables will be examined in a more comprehensive study involving approximately 12,000 subjects. (Author)

AD-775 141/5GA PC$3.00/MF$1.45
Massachusetts Inst of Tech Lexington Lincoln Lab
EDUCATIONAL TECHNOLOGY PROGRAM.
Quarterly technical summary 1 Sep-30 Nov 73,
Frederick C. Frick. 15 Dec 73, 13p ESD-TR-73-341
Contract F19628-73-C-0002
See also report dated 15 Sep 73, AD-769 855.

Descriptors: *Air Force training, Computer applications, Teaching methods, Microfiche, Film readers.
Identifiers: Computer aided instruction.

An LTS-3 terminal was successfully converted to completely stand-alone operation during this quarter, and work has been initiated on the conversion of a second terminal. (Author)

AD-775 151/4GA PC$3.25/MF$1.45
Air Force Human Resources Lab Brooks AFB Tex
DEVELOPMENT OF PSYCHOMETRIC MEASURES OF STUDENT ATTITUDES TOWARD TECHNICAL TRAINING: NORM GROUP REPORT.
Final rept. Dec 70-Jun 71,
Gary G. Miller, and Wayne S. Sellman. Oct 73, 44p Rept no. AFHRL-TR-73-15

Descriptors: *Air Force training, *Psychological tests, Questionnaires, Statistical analysis, Attitudes(Psychology), Test construction(Psychology).

This report describes the Phase II effort of a task to develop a new student critique form for the Air Training Command (ATC). In Phase II additional items were added to the prototype form resulting in a later version of the critique form that had a reliability of .80. The Phase II version of the Student Critique Form (SCF) was administered to a sample of over 1800 students enrolled in technical training courses at six Air Force bases. Norms were gathered separately for officers, NCOs, and airmen since additional analyses indicated, as did the Phase I analyses, that the three groups were significantly different with respect to attitudes as measured by the SCF. Seven scales emerged from a factor analysis of the Phase II version of the SCF. The scales were named as follows: Instructor Competence, Study Environment and Testing, Specialty Training, Training Impressions, Classroom Facilities and Environment, Training Devices and Audio Visual Aids, and Training Materials Adequacy. Phase II of this effort was subsequently initiated to develop the computer software to score and interpret the SCF. (Modified author abstract)

AD-775 236/3GA PC$4.00/MF$1.45
Science Applications Inc Mclean Va
FEASIBILITY OF A COMPUTER SIMULATION FOR THE ACTION-HANDLING PROCESSES OF COMMAND AND CONTROL STAFFS.
Final rept.,
Roland V. Tiede, Roger A. Burt, James J. Connelly, and Michael E. Walker. Nov 73, 91p Rept no. SAI-73-508-WG
Contract DAAG39-73-A-0221

Descriptors: *Command and control systems, *Performance(Human), *Army personnel, *Computerized simulation, Combat information centers, Personnel management, Job analysis, Tactical communications, Tactical intelligence, Data processing, Field army.
Identifiers: *IBCS(Integrated Battlefield Control System), *Integrated battlefield control systems.

The report investigates the feasibility of building a computer simulation that will measure the action handling effectiveness of staffs within the division. Such simulation must represent alternative staff organizational arrangements to include ADP assistance, alternative action handling procedures, and alternative loadings by the events of a scenario. Such a simulation is required as a methodological tool for the conduct of the Integrated Battlefield Control System (IBCS) 3d Refinement Study on staff organization and procedures. The report summarizes the background which gives rise to the need for such a tool and postulates a set of criteria for establishing the feasibility of such a development. The preferred design of such a simulation is described; its inputs and outputs are defined; model size and running time parameters are presented; and the kinds of sensitivity analyses that might be performed are discussed. The relationship of the simulation model (called DIVSIFT) to other existing models, its utilization in the conduct of the IBCS study, and other potential applications are discussed. (Author)

AD-775 253/8GA PC$5.00/MF$1.45
Hudson Inst Inc Croton-on-Hudson N Y
EXPLORING LINKS BETWEEN NAVAL AND CIVILIAN CAREERS: LATERAL TRANSFER AND EIGHT-YEAR CAREERS.
Final rept.,
John Thomas, Frank Armbruster, Peter Karsten, and Raymond Wilson. 7 Dec 73, 166p Rept no. HI-1912-RR
Contract N00014-73-C-0158

Descriptors: *Transfer, *Civilian personnel, *Jobs, *Navy, *Industries, Industrial relations, Feasibility studies, Enlisted personnel, Officer personnel, Naval personnel.
Identifiers: *Naval careers, Eight year careers.

The report examines two specific feasibility areas: lateral transfer of personnel between the Navy and industry, and short naval careers. During the course of the study, discussions were held with senior representatives of 38 corporations, with labor union officials and with several Navy areas, including sections of BuPers and the Naval Training Command. The study has been exploratory in nature and has sought primarily to determine the reaction of industry and of labor to the two concepts. (Modified author abstract)

AD-775 281/9GA PC$3.25/MF$1.45
Naval Postgraduate School Monterey Calif
A SURVEY OF METHODS OF TEACHING MATHEMATICS.
Final rept.,
L. D. Kovach. 31 Dec 73, 33p Rept no. NPS-53KV73121A

Descriptors: *Teaching methods, *Mathematics, Costs, Teaching machines, Computer graphics, Visual aids, Tape recording, Magnetic tape, Training films.

A number of nontraditional methods of teaching mathematics are studied. The methods are compared by listing their advantages, disadvantages and cost. (Author)

AD-775 296/7GA PC$3.75/MF$1.45
Naval Personnel and Training Research Lab San Diego Calif
COMPARISON OF ALTERNATIVE CRITERIA AND WEIGHTING METHODS FOR THE ENLISTED ADVANCEMENT SYSTEM.
Technical bulletin,
David W. Robertson, Jim James, and Marjorie H. Royle. Jun 72, 63p Rept no. STB-72-11

Descriptors: *Naval personnel, *Promotion(Advancement), Enlisted personnel, Job analysis, Performance(Human), Salaries, Statistical analysis.

The Navy Enlisted Advancement System is based on several components which are differentially weighted in arriving at a final ordered listing of the candidates. The components used--technical knowledge exam, on-job performance marks, time in grade and in the Navy, and awards--vary greatly in their statistical properties, and thus the task of combining them in accordance with the policy-designated weights becomes complicated and difficult. The outcome of the advancement process--that is, the acutal selection of those to be advanced--has been found to be more a function of the statistical peculiarities of the components used and of the methods used in combining them, than of published policy. The report describes a comparison of several approaches to combining scores and weighting components used in the advancement competition to Pay Grades E4-E7. The qualifications of candidates who were selected, and who would have been selected had other cutting scores and weighting methods been used, were compared. The proportionate influences of the components were found to vary widely as a function of advancement opportunity, cutting scores used, and pay grade. (Author)

AD-775 318/9GA PC$3.75/MF$1.45
Michigan Univ Ann Arbor Inst for Social Research
EXPRESSED PREFERENCES AND ORGANIZATIONAL PRACTICES EXPERIENCED BY NAVY OFFICERS.
Technical rept. 1 Apr 72-30 Jun 73,
David G. Bowers. Dec 73, 72p
Contract N00014-67-A-0180-0048

Descriptors: *Job analysis, *Naval personnel, *Officer personnel, Attitudes(Psychology), Questionnaires, Statistical analysis, Job satisfaction.
Identifiers: Age, Organizational climate.

An earlier report examined the personal background differences in organizational values and preferences of Navymen. The present report looks at similar effects for Navy officers alone. As in the broader report, young Navy officers report perceptions of a bureaucratic structure which allows too little personal autonomy. Despite the basically positive, constructive relationships which exist with supervisors and peers, the organizational climate is therefore seen in relatively negative terms. Young officers seem by and large relatively dissatisfied. (Author)

AD-775 331/2GA PC$4.00/MF$1.45
System Automation Corp Silver Spring Md
STUDY OF ALTERNATIVE DESIGNS FOR THE BUPERS OFFICER DISTRIBUTION PLAN (U).
Final rept. Jun-Nov 73,
Edward G. Loges. 30 Nov 73, 85p Rept no. D194
Contract N00014-73-C-0483

Descriptors: *Naval personnel, *Manpower utilization, Mathematical models, Allocations, Rotation, Optimization, Forecasting, Distribution, Officer personnel.

The report shows the feasibility of a mathematical model to assist in allocating available manpower resources to manpower requirements. This model can be used to predict in advance, the posture of the Naval officer force in terms of officer rotations and reassignments and the resultant satisfied and unsatisfied manpower spaces, under constraints of present policy; and facilitate evaluation of alternative policies proposed to correct existing or predicted manpower shortages. (Author)

AD-775 390/8GA PC$5.75/MF$1.45
Human Resources Research Organization Alexandria Va
UH-1 HELICOPTER MECHANIC (MOS 67N20) JOB DESCRIPTION SURVEY: BACKGROUND, TRAINING, AND GENERAL MAINTENANCE ACTIVITIES.
Technical rept.,
Russel E. Schulz, Barbara K. FitzGerald, and Wallace W. Prophet. Dec 73, 203p Rept no. HumRRO-TR-73-33
Contract DAHC19-73-C-0004

Descriptors: *Engineers, *Maintenance personnel, *Helicopters, Job analysis, Aircraft maintenance, Job training, Surveys, Questionnaires, Background, Statistical data.
Identifiers: UH aircraft, UH-1 aircraft, *Helicopter mechanics, *Task analysis.

The report describes the planning, conduct, analysis, and results of a worldwide survey of the maintenance activities of over 5,000 UH-1 helicopter mechanics, MOS 67N20. It describes methods and techniques used in developing the survey questionnaire and a job description inventory covering more than 1,400 helicopter maintenance tasks, administration of the survey by mail and by research teams in the field, and extraction and analysis of survey results. The report provides a broad profile of UH-1 maintenance personnel, their training and background, and a description of the UH-1 mechanic's general job activities. Data concerning performance of the 1,400+ maintenance tasks are presented in a companion report. (Author)

AD-775 474/0GA PC-GPO/MF$1.45-NTIS
Office of Air Force History Washington D C
SOLDIERS AND STATESMEN. PROCEEDINGS OF THE MILITARY HISTORY SYMPOSIUM (4TH) HELD AT THE AIR FORCE ACADEMY, COLO., ON 22-23 OCTOBER 1970,
Monte D. Wright, and Lawrence J. Paszek. 1973, 216p
Availability: Paper copy available from GPO $1.60 as stock no. 0870-00335.

Descriptors: *Air force, *Officer personnel, *Leadership, Symposia, Political science, Warfare, Military training, Education.

The symposium is settled on a historical investigation of the recent past to remind the military how important the relationship is between soldiers and statesmen; and to examine how various societies have approached the problems involved in that relationship. The symposium treats the U.S. and Western European experience of the 19th century, then the U.S. experience between Versailles and Potsdam, and finally the postwar experience in the concluding session.

AD-775 483/1GA PC$4.00/MF$1.45
Army War Coll Carlisle Barracks Pa
BASIC EDUCATION WITHIN THE MILITARY.
Student essay,
Dean W. Meyerson. 9 Nov 70, 19p

Descriptors: *Education, *Military personnel, Reviews.

The purpose of the essay is to place 'Project One Hundred Thousand' in context with the antecedents of this basic educational program, to provide insight to existing operational characteristics, and to determine what can be seen now concerning this type of US Army effort in the future. The essay concludes that to meet the emerging manpower situation US Army remedial education responsibilities will be extended into the 1970-1980 time frame but should incorporate different selection and training methods. (Author)

AD-775 488/0GA PC$4.00/MF$1.45
Army War Coll Carlisle Barracks Pa
CAREER DEVELOPMENT FOR LONG-RANGE PLANNERS.
Student essay,
Charles D. Palmer. 27 Oct 70, 14p

Descriptors: *Planning, *Personnel development, *Officer personnel.

The increased emphasis on military long-range planning indicates that it may be timely to establish a career development program for officers in that field. The paper reviews the characteristics of long-range planning including some of the tools and techniques which can be applied to that process. A career development program is proposed for the identification, training and assignment of military long-range planners with discussion as to means for accomplishing those development actions. (Author)

N74-15683/7GA PC$4.50/MF$1.45
National Association of Schools of Public Affairs and Administration, Washington D.C.
SCIENCE LEADERSHIP FOR TOMORROW: THE ROLE OF SCHOOLS OF PUBLIC AFFAIRS AND UNIVERSITIES IN MEETING NEEDS OF PUBLIC SCIENCE AGENCIES.
A. H. Rosenthal, R. F. Wilcox, F. Marini, and H. C. Reeves. Nov 73, 46p NASA-CR-136589, LC-73-90891
Contract NGL-32-004-042
Subm-Sponsored by NSF.

Descriptors: *Governments, *Management planning, *Scientists, *University program, Manpower, Personnel management, Policies.

For abstract, see STAR 1206

PB-228 383/6GA PC-GPO/MF$1.45-NTIS
Joint Committee on Manpower Needs in Medical Physics.
STATUS AND FUTURE MANPOWER NEEDS OF PHYSICISTS IN MEDICINE IN THE UNITED STATES.
Technical rept.
Nov 73, 60p DHEW/FDA-74-8014
Contract PH-86-67-202
Paper copy available from GPO as stock no. 1712-00198.

Descriptors: *Physicists, *Medicine, *Radiology, Job analysis, Public health, Research, Manpower utilization, Specialized training, Project planning, Requirements, Budgeting, Recommendations.
Identifiers: *Medical physicists.

The primary purpose of the study was to provide a basis for describing the job responsibilities of medical physicists in the radiological health sciences. The report includes an estimate of the manpower needs for physicists and the influence of these needs on medical physics training programs.

PB-228 626/8GA PC$4.50/MF$1.45
West Virginia Div. of Vocational Rehabilitation, Charleston.
SERVING THE RURAL COUNTY.
Final rept. 1 Feb 71-1 Jan 74,
William R. Phelps. 31 Jan 74, 26p
Grant SRS-25-65287

Descriptors: *Vocational guidance, *West Virginia, *Rural areas, Rehabilitation, Project planning, Services, Organizations, Professional personnel, Transportation, Social welfare, Community relations, Placement, Cooperation, Counseling, Management methods.
Identifiers: *Vocational rehabilitation, *Webster County(West Virginia).

The principal objective of this project was to demonstrate a new approach to the delivery of vocational rehabilitation services in rural counties. A three year expansion project was conducted in a typical rural county of West Virginia, Webster County. The office was staffed with a counselor, a case aide worker, and a clerical worker, and the office provided vehicular transportation for client services. Emphasis was placed on the delivery of services through inter-agency cooperation and innovative features, including the use of a counselor aide, a plan for transporting clients for services, approaches to increase production, and stressing prompt and thorough attention to referrals. Over the three year project period, the project served 510 clients and rehabilitated 163 clients into substantial, gainful occupations.

PB-228 717/5GA PC$6.75/MF$1.45
George Washington Univ., Washington, D.C.
PUBLIC SERVICE EMPLOYMENT FOR THE DISADVANTAGED.
Final rept.,
Lowell Marshall Glenn. Dec 73, 279p DLMA-91-11-71-20-1
Contract DL-91-11-71-20
Doctoral thesis.

Descriptors: *Social welfare, *Manpower utilization, *Government employees, Civil service, Cost effectiveness, Earning, Employment, Evaluation, Theses, Labor relations, Local government, National government, Performance evaluation, Socioeconomic status, Unemployment, Unskilled workers, Upgrading.
Identifiers: Public service employment, Disadvantaged groups, Income redistribution.

This study reviews some of the alternative models of public service employment (PSE) that haveemerged or might be appropriate in the future. It explores the basic purposes to which government policies might be directed in manpower and employment activities and concludes that PSEis probably more effective as a redistribution program than as an anti-cyclical technique or a method for improving the basic employability of program participants. The study then examines the current emphasis of PSE activities and suggests that the program be redirected to better serve the needs of those who have previously been excluded from meaningful participation in the world of work. An analysis is made of the characteristics of public employment from which PSE positions must be drawn. The differences between public employment and PSE are explained. The study then reviews some of the operating and administrative difficulties which may be encountered in an attempt to implement a major PSE program for the disadvantaged or residual worker who cannot compete in the regular labor market. Finally, some conclusions are drawn concerning the political, economic, and administrative feasibility of implementing a PSE program for the disadvantaged, now and in the future. (Modified author abstract)

PB-228 880/1GA PC$4.75/MF$1.45
National Safety Council, Chicago, Ill.
GUIDELINES FOR DEVELOPING AN INJURY AND DAMAGE REDUCTION PROGRAM IN MUNICIPAL POLICE DEPARTMENTS.
Apr 73, 130p*
Contract LEAA-NI-70-058
Paper copy alsoavailable from GPO $2.10 as stock no. 2700-00177.

Descriptors: *Police, *Personnel management, Injuries, Damage, Reduction, Accidents, Standards, Education, Planning.

The manual presents methods, procedures and programs for planning, organizing, managing and operating an Injury and Damage Reduction (IDR) function in a municipal police department. A recommended IDR records system is presented and described as are complete programs for training and inspection.

PB-229 512/9GA PC$11.00/MF$1.45
Federal Communications Commission, Washington, D.C. Broadcast Bureau.

EMPLOYMENT IN THE BROADCASTING INDUSTRY - 1973. REPORT ON FEMALE AND MINORITY GROUPS EMPLOYMENT IN RADIO AND TELEVISION BROADCAST STATIONS.
Rept. for 31 Dec 71-30 Mar 73.
Jan 74, 597p FCC-BC-395-73

Descriptors: *Radio broadcasting, *Television broadcasting, *Employment, Females, Negroes, Ethnic groups, Statistics.
Identifiers: *Minority groups.

Listing of all radio and television stations and headquarter offices that employ more than 10 full time persons, showing for each station the number of female, Negro, oriental, American Indian and Spanish-speaking employees in the higher and lower pay categories.

PB-229 615/0GA PC$4.25/MF$1.45
Regional Counselor Training Center, Charleston, W. Va.
EVALUATION OF JOINT TRAINING DVR-DFW PERSONNEL, WEST VIRGINIA AND VIRGINIA, REHABILITATION OF THE DISABLED WELFARE APPLICANT AND/OR RECIPIENT.
Final rept.,
William R. Phelps. 6 Mar 74, 25p
Grant SRS-44-15092

Descriptors: *Rehabilitation, *Education, *Professional personnel, Handicapped workers, Social welfare, Chi square test, Demography.

This is a follow-up post-training of 210 program participants of rehabilitation practitioners, including social case workers, rehabilitation counselors, and para-professional staff members. These rehabilitation practitioners were involved in, 'Vocational Rehabilitation of Disabled Welfare Applicants and/or Recipients,' within the States of Virginia and West Virginia. In all six training sessions, content of the curriculum was replicated. A Chi-Square Analysis of selected demographic participant variables was related to the content of the agenda to ascertain any existing relationships. The variables evaluated were education of the participants, age, sex, months employed, work assignment, job satisfaction, and earnings. Significant relationships were found to exist between the months employed and the presentation of, 'Appalachian Culture,' and the earnings level and, 'Internal and External Locus of Control, and various selected film presentations. All other variables were found to be non-significant.

TT-72-55145/02 PC$3.25/MF$1.45
Office of Education, Washington, D.C.
SELECTED BIBLIOGRAPHY OF EDUCATIONAL MATERIALS: ALGERIA, LIBYA, MOROCCO, AND TUNISIA. VOLUME 6, NUMBER 2, 1972,
Azzedine Azzouz, Christiane Djemili, and Margaret Duggan Saidi. 1973, 44p
The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Education, *Bibliographies, Algeria, Libya, Morocco, Tunisia, Programmed instruction, Schools, Theories, Specialized training, Adults, Children, Instructors.

The report contains materials on educational philosophy, organization, and theory; adult, teacher, religious, artistic, and special education; and methods and aids.

5J. Psychology (Individual and Group Behavior)

AD-774 772/8GA Reprint
Harvard Univ Cambridge Mass Psycho-Acoustic Lab
BASIC CORRELATES OF THE AUDITORY STIMULUS,
J. C. R. Licklider. 1951, 56p Rept no. PNR-78
Contract N5ori-7602
Prepared in cooperation with Massachusetts Inst. of Tech., Cambridge.
Availability: Pub. in Stevens Handbook of Experimental Psychology, ch25 p985-1039 1951.

Descriptors: *Psychophysics, Hearing, Auditory perception, Stimuli, Sound, Audio frequency, Waveforms, Intensity.

The report considers a few of the fundamental characteristics of sound vibrations and develops a language that describes them effectively.

AD-774 776/9GA Reprint
Harvard Univ Cambridge Mass Psycho-Acoustic Lab
MATHEMATICS, MEASUREMENT, AND PSYCHOPHYSICS,
S. S. Stevens. 1951, 50p Rept no. PNR-76
Contract N5ori-7602
Availability: Pub. in Stevens-Handbook of Experimental Psychology, ch1 p1-49 1951.

Descriptors: *Psychophysics, *Mathematics, Measurement, Stimuli, Mathematical models.

The application of mathematics to the measurement of psychophysics is discussed. Mathematical models are described.

AD-774 777/7GA Reprint
Harvard Univ Cambridge Mass Psycho-Acoustic Lab
SENSITIVITY TO CHANGES IN THE INTENSITY OF WHITE NOISE AND ITS RELATION TO MASKING AND LOUDNESS,
George A. Miller. 17 Mar 47, 13p Rept no. PNR-28
Contract N5ori-7602
Previously announced as PB-87 223.
Availability: Pub. in Jnl. of the Acoustical Society of America, v19 n4 pt1 p609-619 Jul 47.

Descriptors: *White noise, *Auditory perception, *Psychoacoustics, Hearing, Intensity.
Identifiers: *Auditory masking, Loudness.

Sensitivity to changes in the intensity of a random noise was determined over a wide range of intensities. The just detectable increment in the intensity of the noise is of the same order of magnitude as the just detectable increment in the intensity of pure tones. For intensities more than 30 db above the threshold of hearing for noise the size in decibels of the increment which can be heard 50 percent of the time is approximately constant (0.41 db). When the results of the experiment are regarded as measures of the masking of a noise by the noise itself, it can be shown that functions which describe intensity discrimination also describe the masking by white noise of pure tones and of speech. It is argued, therefore, that the determination of differential sensitivity to intensity is a special case of the more general masking experiment. The loudness of the noise was also determined, and just noticeable differences are shown to be unequal in subjective magnitude. (Modified author abstract)

AD-774 779/3GA Reprint
Harvard Univ Cambridge Mass Psycho-Acoustic Lab
THE MASKING OF TONES BY REPEATED BURSTS OF NOISE,
George A. Miller, and W. R. Garner. 6 May 48, 8p Rept no. PNR-45
Contract N5ori-7602
Availability: Pub. in The Jnl. of the Acoustical Society of America, v20 n5 p691-696 Sep 48.

Descriptors: *Psychoacoustics, *Audiometry, Noise, White noise, Auditory signals, Auditory perception, Hearing, Psychophysiology.
Identifiers: *Auditory masking.

The masking of tones by continuous and interrupted noise was determined for three noise intensities, three noise-time fractions, and rates of interruption varying from 0.5 to 512 interruptions per second. The decrease in masking effectiveness as a result of the discontinuity of the masking noise depends principally upon the duration of the silent interruption, and secondarily upon the frequency of the masked tone and the intensity of the noise. A computational device is presented which will permit a first approximation of the masking produced by interrupted noises. (Author)

AD-774 780/1GA Reprint
Harvard Univ Cambridge Mass Psycho-Acoustic Lab
PHYSIOLOGICAL NOISE GENERATED UNDER EARPHONE CUSHIONS,
W. J. Brogden, and George A. Miller. 25 Mar 47, 6p Rept no. PNR-31
Contract N5ori-7602
Previously announced as PB-87 224.
Availability: Pub. in Jnl. of the Acoustical Society of America, v19 n4 pt1 p620-623 Jul 47.

Descriptors: *Audiometry, *Sound pressure, *Hearing, *Psychoacoustics, Low frequency, Noise, Vibration, Mechanical properties, Psychophysiology.

Listeners were required to match the quality and intensity of a low frequency ambient noise to the quality and intensity of the noise which they heard when they held earphones over both ears. A sound-pressure of 55 or 60 db of rumbling, low frequency noise can be generated by the tremor of the tonic contractions of hand and arm muscles. (Author)

AD-774 782/7GA Reprint
Harvard Univ Cambridge Mass Psycho-Acoustic Lab
ON THE DIFFRACTION OF A PROGRESSIVE SOUND WAVE BY THE HUMAN HEAD,
Francis M. Wiener. 1946, 6p Rept no. PNR-30
Contract N5ori-7602
Presented at the Meeting of the Acoustical Society of America (32nd), Chicago, Ill., 16 Nov 46. Previously announced as PB-80 874.
Availability: Pub. in Jnl. of the Acoustical Society of America, v19 n1 p143-146 Jan 47.

Descriptors: *Sound pressure, *Auditory perception, Sound, Diffraction, Hearing, Ear, Head(Anatomy), Orientation(Direction).

The study is concerned with the direct experimental evaluation of the magnitude of the sound pressures at the right and left eardrums of a number of observers exposed to a progressive sound wave with vertical wave front, as a function of frequency and angle of incidence. Data are also presented showing the obstacle effect of the head and auditory canal over a range of azimuth covering 360 degrees.

AD-774 909/6GA PC$3.00/MF$1.45
Office of Naval Research London (England)
PSYCHOLOGY AT FOUR SCOTTISH UNIVERSITIES,
James T. Lester. 17 Dec 73, 17p Rept no. ONRL-R-29-73

Descriptors: *Psychology, *Universities, *Programmed instruction, *Great Britain, Scientific research, Reviews, Instructors, Laboratories, Students, Methodology.
Identifiers: Edinburgh(Scotland), Stirling(Scotland), Glasgow(Scotland), Strathclyde(Scotland).

The report describes various characteristics and research activities of four Scottish psychology departments: Edinburgh, Stirling, Glasgow, and Strathclyde. (Author)

AD-774 921/1GA Reprint
Harvard Univ Cambridge Mass Psycho-Acoustic Lab
ACOUSTIC ATTENUATION BETWEEN THE EARS,
Jozef Zwislocki. 9 Apr 53, 14p Rept no. PNR-132
Contract N5ori-7602
Errata sheet inserted.
Availability: Pub. in Jnl. of the Acoustical Society of America, v25 n4 p752-759 Jul 53.

Descriptors: *Psychoacoustics, *Hearing, Conductivity, Bones, Sound, Attenuation, Ear, Auditory perception, Thresholds(Physiology).

In an investigation of the acoustical insulation between the ears, various earphones and obturating devices were used. Bone conduction was shown to be chiefly responsible for the acoustical leakage between the ears. Conditions were determined under which interaural insulation could be increased considerably. Most of the measurements were performed with a compensation method which appears to give more precise results than methods previously used, and which permits phase measurements. (Author)

AD-774 922/9GA Reprint
Harvard Univ Cambridge Mass Psycho-Acoustic Lab
REVIEW OF RECENT MATHEMATICAL THEORIES OF COCHLEAR DYNAMICS,
Jozef Zwislocki. 9 Apr 53, 11p Rept no. PNR-134
Contract N5ori-7602
Availability: Pub. in Jnl. of the Acoustical Society of America, v25 n4 p743-751 Jul 53.

Descriptors: *Ear, *Biomechanics, *Hearing, *Psychoacoustics, Theory, Mathematical analysis, Psychophysiology.
Identifiers: Cochlea.

An analysis of several theories of cochlear mechanics has been attempted on the basis of general hydrodynamic theory. The theories are divided into two classes according to the mathematical treatment. The first class assumes that transverse waves propagated along the cochlea are long in comparison to the cross-sectional dimension of the canal: all theories of this class can be deduced from one differential equation when the emphasis is put on different factors. The second class assumes that the waves are relatively not long, and the mathematical treatment becomes a boundary problem to which no exact solution has yet been found. The analysis of the individual theories indicates a certain convergence of opinions, and it is clear that definite progress has been achieved toward an understanding of the dynamic behavior of the cochlea. In spite of this trend, however, no one of the theories seems entirely satisfactory. (Author)

AD-774 924/5GA Reprint
Harvard Univ Cambridge Mass Psycho-Acoustic Lab
SHEARING MICROPHONICS PRODUCED BY VIBRATIONS NEAR THE INNER AND OUTER HAIR CELLS,
G. v. Bekesy. 30 Mar 53, 7p Rept no. PNR-137
Contract N5ori-7602
Availability: Pub. in Jnl. of the Acoustical Society of America, v25 n4 p786-790 Jul 53.

Descriptors: *Hearing, *Psychoacoustics, *Psychophysics, *Biomechanics, *Ear, Shear stresses, Mechanical properties, Vibration, Stimulation(Physiology).
Identifiers: Corti organ, Tectorial membrane of cochlear duct.

It is possible to show that a laterally vibrating needle placed on the tectorial membrane produces microphonics. The size of these microphonics changes according to the direction of the lateral movements and the place on the tectorial membrane. On the outer edge of the tectorial membrane the microphonics went through a maximum when the direction of the vibrations lay in the direction of the fibers of the tectorial membrane. Perpendicular to this direction the microphonics went through a minimum. On the inner edge of the tectorial membrane the whole direction pattern is turned around counterclockwise somewhat less than 90 degrees. There are two sets of microphonic generators very close to the inner and outer hair cells. The inner set is more sensitive to lack of oxygen. These two sets may be able to discriminate between the radial and longitudinal vibrations of the organ of Corti, a change that occurs near the place of maximal stimulation in the cochlea exposed to a tone. (Author)

AD-774 951/8GA Reprint
Harvard Univ Cambridge Mass Psycho-Acoustic Lab
THE EFFECT OF EXPOSURE TO LOUD TONES UPON ANIMAL AND HUMAN RESPONSES TO ACOUSTIC CLICKS,
Walter A. Rosenblith, Robert Galambos, and Ira J. Hirsh. 1950, 4p Rept no. PNR-83
Contract N5ori-76
Availability: Pub. in Science, v111 n2891 p569-571, 26 May 50.

Descriptors: *Auditory perception, *Hearing, *Psychoacoustics, Noise, Fatigue(Physiology), Electrophysiology, Stimulation(Physiology), Response(Biology), Psychophysiology.
Identifiers: Loudness.

Auditory fatigue can be defined broadly as a more or less temporary loss of auditory sensitivity due to previous auditory stimulation. There seem to be several types of fatigue, characterized by different time courses, degrees of reversibility, and frequency patterns of impaired response, but the great variability in reported data precludes a precise definition of these types. The advent of electrophysiological recording from the ear suggested that measurement of the electrical output of the ear might yield an objective index of fatigue. The results obtained in previous studies of cochlear potentials, however, were largely disappointing. A depression of the electrical response was usually obtained only when the stimulation was intense enough to cause damage to the responding mechanism.

AD-774 952/6GA Reprint
Harvard Univ Cambridge Mass Psycho-Acoustic Lab
A GRIDLESS, WIRELESS RAT-SHOCKER,
J. C. R. Licklider. 7 Apr 50, 6p Rept no. PNR-86
Contract N5ori-76
Availability: Pub. in Jnl. of Comparative and Physiological Psychology, v44 n3 p334-337 Jun 51.

Descriptors: *Laboratory equipment, Electricity, Shock, Rats, Laboratory animals, Laboratory procedures.
Identifiers: *Electrical shock.

A rat-conditioning apparatus, making use of capacitance between rat and ground to complete the circuit to a spark-coil shock generator, is described. The ground plate consists of two sheets of aluminum. The floor is of wire mesh, supported on a bakelite frame so that it makes electrical contact only with the lead to the 'hot' terminal of the generator. Since the floor is suspended like a seesaw, the rat, running from one end to the other to escape the shock, 'responds' by tipping the floor from one tilt to the other. A loudspeaker, buzzer, or light provides a discriminative stimulus. With this apparatus, the experimenter need not be present to remove short-circuiting feces or to prod the rat from a position in which it avoids the shock: there is nothing to be short-circuited, there is no shockproof position.

AD-774 953/4GA Reprint
Harvard Univ Cambridge Mass Psycho-Acoustic Lab
THE INFLUENCE OF INTERAURAL PHASE ON MASKED THRESHOLDS. I. THE ROLE OF INTERAURAL TIME-DEVIATION,
Frederic A. Webster. 23 Mar 51, 13p Rept no. PNR-89
Contract N5ori-76
Availability: Pub. in Jnl. of the Acoustical Society of America, v23 n4 p452-462 Jul 51.

Descriptors: *Auditory perception, *Psychoacoustics, Thresholds(Physiology), Auditory signals, Audio frequency, Hearing, Psychophysiology.
Identifiers: Auditory masking.

When a narrow band of noise, of constant level (the signal) is masked by a wider band of noise (the masker), the amount of noise required to drown out the signal often depends significantly upon the interaural phase relations of signal and masker. Thus, more masking noise is required if the signal is 180 degrees out of phase at the two ears than if it is in phase: provided that the masker remains in phase. The out-of-phase signal, in other words, shows an advantage in audibility. The advantage is very striking for a signal near 250 cps; and falls off progressively toward 1400 cps, above which it is small. At all frequencies between 250 and 6000 cps, the level of masking, for a signal in phase at the ears, remains relatively constant. (Modified author abstract)

AD-774 956/7GA Reprint
Harvard Univ Cambridge Mass Psycho-Acoustic Lab
CORTICAL CORRELATES OF AUDITORY LOCALIZATION AND OF RELATED PERCEPTUAL PHENOMENA,
Mark R. Rosenzweig. 15 Oct 53, 10p Rept no. PNR-142
Contract N5049-76
Prepared in cooperation with California Univ., Berkeley.
Availability: Pub. in Jnl. of Comparative and Physiological Psychology, v47 n4 p269-276 Aug 54.

Descriptors: *Psychophysics, *Auditory perception, *Cerebral cortex, Hearing, Central nervous system, Stimulation(Physiology), Response(Biology), Electrophysiology, Psychophysiology, Cats, Experimental data.
Identifiers: Neurophysiology.

Electrophysiological responses were recorded at the auditory cortex of anesthetized cats. The stimulus conditions duplicated those of psychophysical experiments on auditory localization. The two ears were stimulated independently with clicks. Differences in the time of arrival of clicks at the two ears and differences in intensity of the clicks were varied. The dependence of cortical responses on these stimulus conditions was determined. The cortical events were found to parallel in several respects the perceptual phenomena which occur under the same stimulus conditions.

AD-774 957/5GA Reprint
Harvard Univ Cambridge Mass Psycho-Acoustic Lab
SUBJECTIVE MUSICAL PITCH,
W. D. Ward. 5 Feb 54, 14p Rept no. PNR-145
Contract N5ori-76
Availability: Pub. in Jnl. of the Acoustical Society of America, v26 n3 p369-380 May 54.

Descriptors: *Pitch discrimination, *Hearing, *Psychoacoustics, Psychophysiology, Auditory perception.

The subjective relation 'octave of' is demonstrated to be a valid interval for determining scales of musical pitch for pure tones presented successively. Octave judgments of trained musicians have a standard deviation averaging about 0.6 percent. Inter-observer variability is 2 to 5 times as great, increasing with frequency. Judgments vary significantly from day to day, but as the direction

of shift at different frequencies for a single observer is random, the shifts cannot be attributed to changes in the octave criterion. Instead, this variability, and differences between right- and left-ear judgements of a given observer, the change in difference between subjective and physical octaves as a function of frequency, and the high inter-observer variability, all conform the basic instability of pitch-frequency relations implied by the facts of binaural displacusis. (Modified author abstract)

AD-774 965/8GA Reprint
Harvard Univ Cambridge Mass Psycho-Acoustic Lab
THE MEASUREMENT OF HEARING,
Ira J. Hirsh. 1952, 3p Rept no. PNR-118
Contract N5ori-76
Availability: Pub. in Psychological Book Previews, v2 n3 p27-29 Jul 52.

Descriptors: *Hearing, *Psychophysics, Measurement, Psychoacoustics, Psychophysiology, Auditory perception, Books, Reviews.
Identifiers: *Audiometry.

The author has attempted to draw such information as necessary from several of the basic sciences that contribute to the psychophysics of hearing. The first three chapters deal with the measurement, production, and control of auditory stimuli and appropriate responses. The next six chapters treat six types of auditory measurements and their clinical applications and limitations. A single chapter examines the relations between basic principles in conditioning and psychophysical measurements. A final chapter summarizes the relevant points of the preceding detailed chapters so as to provide a fairly concise manual or rule-book for the clinical measurement of various auditory functions.

AD-774 988/0GA Reprint
Harvard Univ Cambridge Mass Psycho-Acoustic Lab
THE MECHANICAL PROPERTIES OF THE EAR,
Georg von Bekesy, and Walter A. Rosenblith.
1951, 42p Rept no. PNR-80
Contract N5ori-76
Availability: Pub. in Stevens Handbook of Experimental Psychology, p1075-1116 1951.

Descriptors: *Ear, *Biomechanics, *Hearing, *Psychoacoustics, Vibration, Mechanical properties, Anatomy, Auditory perception, Psychophysiology.
Identifiers: Cochlea.

Many theories have been proposed to account for the phenomena of hearing. Theorizing has flourished principally because the location and the size of the various parts of the ear make it difficult to measure their physical properties with accuracy. Consequently, knowledge of the mechanical properties of the ear is sketchy, and even more fragmentary is an understanding of the translation of mechanical processes into neural stimuli. This report attempts to separate the function of the ear, as a mechanical transducer, from the function of the nervous system, and to examine the mechanical processes in the ear that relate to the theory of hearing.

AD-774 993/0GA MF$1.45
Harvard Univ Cambridge Mass Psycho-Acoustic Lab
THE EAR AND THE EYE,
S. S. Stevens. 1974, 14p Rept no. PNR-162
Contract N5ori-7602
Availability: Available in microfiche only.

Descriptors: *Psychophysics, *Visual perception, *Auditory perception, *Electrophysiology, *Sense organs, Ear, Eye, Stimulation(Physiology), Stimuli, Response(Biology), Psychophysiology.

The paper reviews some of the important similarities between vision and audition, especially as regards the electrical activities of the sense organs and the manner of their response to the intensity of the stimulus. It is demonstrated that subjective brightness and subjective loudness are similar functions of stimulus intensity. In fact, they are both proportional approximately to the cube root of the physical energy of the stimulus. Furthermore, the variations in the growth of loudness, known as auditory recruitment, have their parallel in vision. Four distinguishable classes of recruitment occur in both the eye and the ear.

AD-775 008/6GA PC$3.75/MF$1.45
Advisory Group for Aerospace Research and Development Paris (France)
CLINICAL PSYCHOLOGY AND PSYCHIATRY OF THE AEROSPACE OPERATIONAL ENVIRONMENT.
Conference proceedings no. 133,
P. J. O'Connor. Dec 73, 69p Rept no. AGARD-CP-133
NATO furnished.

Descriptors: *Clinical medicine, *Psychiatry, *Psychology, *Flight crews, Fear, Behavior, Hypoxia, Stress(Psychology), Conferences, Personality, Environments.

Twelve papers were presented. Psychiatrists and psychologists from eight NATO countries met to discuss recent advances in selection of aircrew, stress in the ecology of military flying and its measurement, treatment of psychiatric illness in aircrew and the prognosis for resuming military flying after psychiatric illness.

AD-775 169/6GA Reprint
Harvard Univ Cambridge Mass Psycho-Acoustic Lab
THE PERCEPTION OF SPEECH,
J. C. R. Licklider, and George A. Miller. 1951, 36p Rept no. PNR-79
Contract N5ori-76
Prepared in cooperation with Massachusetts Inst. of Tech., Cambridge, Mass.
Availability: Pub. in Stevens Handbook of Experimental Psychology, p1040-1074 1951.

Descriptors: *Speech, *Auditory perception, Intelligibility, Distortion, Acoustic properties.
Identifiers: Auditory masking.

A review is presented of physical dimensions of vocal stimuli, intelligibility, the relation between intensity and intelligibility, masking of speech, frequency selectivity, and distortion.

AD-775 196/9GA Reprint
Harvard Univ Cambridge Mass Psycho-Acoustic Lab
VOLUME AND LOUDNESS OF NOISE,
Garth J. Thomas. 29 Jan 50, 7p Rept no. PNR-85
Contract N5ori-7602
Prepared in cooperation with Chicago Univ., Ill.
Availability: Pub. in The American Jnl. of Psychology, v65 n4 p588-593 Oct 52.

Descriptors: *Auditory perception, *White noise, Volume, Intensity, Bandwidth.

An experiment was undertaken to determine whether Os could equate various bandwidths of 'white' noise in respect of volume, and whether the volumic equations would be different from equations of loudness.

AD-775 205/8GA PC$3.75/MF$1.45
Michigan Univ Ann Arbor Inst for Social Research
VALUES, PREFERENCES AND PERCEPTIONS CONCERNING MILITARY SERVICES: PART II.
Technical rept., 1 Jul 73-31 Dec 73,
Jerald G. Bachman. Feb 74, 75p
Contract N00014-67-A-0181-0048

See also Part 1, AD-763 483.

Descriptors: *Military forces(United States), *Attitudes(Psychology), Volunteers, Public opinion, Recruiting, Enlisted personnel, Naval personnel, Civilian personnel.
Identifiers: All volunteer armed forces, Preferences.

The report continues an analysis of perceptions and attitudes concerning military service, and the way they are linked to views relevant to enlistment. Data are based on a sixteen-page self-completed questionnaire administered to a national sample of civilians and a cross-section of Navy personnel. The broadest finding of the research is that attitudes about enlistment, and also plans for re-enlistment among Navy men, are closely linked to a wide range of other views about the military services and their mission. The findings suggest that, under present conditions, an all-volunteer force is likely to recruit and retain personnel from only part of the ideological range found in the civilian population. The very individuals who are needed to broaden the balance in the Navy are the least likely to enlist--or re-enlist. (Modified author abstract)

AD-775 308/0GA PC$3.25/MF$1.45
Michigan Univ Ann Arbor Inst for Social Research
AN INQUIRY INTO THE EFFECTIVENESS OF MANAGERIAL AND PEER GOAL EMPHASIS AS SOCIALIZERS OF INDIVIDUAL VALUES AND PREFERENCES.
Technical rept. 1 Apr 72-30 Jun 73,
John A. Drexler, Jr. Jan 74, 32p
Contract N00014-67-A-0181-0048

Descriptors: *Naval personnel, *Human relations, Sociology, Leadership, Management, Social psychology.
Identifiers: Peer groups, Values.

The report represented an investigation into the effects of Managerial and peer goal emphasis, used here as socializing variables, on individual values and preferences. It was found that goal emphasis could account for only minimal amounts of the variance in these values and preferences. (Author)

AD-775 309/8GA PC$3.75/MF$1.45
Michigan Univ Ann Arbor Inst for Social Research
HIERARCHICAL DIFFERENCES IN NAVY FUNCTIONING.
Technical rept. 1 Apr 72-30 Jun 73,
Jerome L. Franklin. Feb 74, 51p
Contract N00014-67-A-0181-0048

Descriptors: *Naval operations, *Organization theory, Naval personnel, Group dynamics, Human resources, Motivation, Leadership, Social psychology, Job analysis.
Identifiers: Age, Peer groups.

The investigation had as its major goal an expansion and clarification of information from earlier reports focusing upon the Navy as a functioning organization. Three areas of interest formed the bases of this study. The first was differences in policies and practices across organizational levels within the Navy, and comparability of these factors with appropriately matched levels from civilian organizations. The second area concerned the relative influences of organizational level and age upon the reported differences within the Navy. The third area of interest was with relationships among four major factors within the Navy and the comparability with similar relationships within civilian business and industrial organizations. (Author)

AD-775 312/2GA PC$6.25/MF$1.45
California Univ Berkeley Inst of Industrial Relations

RESPONSES, RESPONDING UNITS, AND SETTINGS: BASIC INGREDIENTS IN ORGANIZATIONAL RESEARCH.
Technical rept.,
Karlene H. Roberts, and Charles L. Hulin. Feb 74, 62p Rept no. TR-5
Contract N00014-69-A-0200-1054
Prepared in cooperation with Illinois Univ., Urbana.

Descriptors: *Organization theory, *Group dynamics, Behavior, Sociology, Models, Methodology, Scientific research.

An attempt was made to provide a framework for understanding research on behavior in organizations. This framework, with its attendant language, is intended to suggest research strategies appropriate for analyzing antecedent conditions and consequences of individual and organizational characteristics. In addition, application of the framework should suggest those vectors used to characterize responding units and environments which are badly in need of conceptual and empirical development. An argument was presented for the simultaneous assessment of the effects of responding units and environments on multivariate response surfaces. Examples of the kind of research which might be designed using this framework were presented and suggestions made about broadly defined content areas in need of research attention. Finally, a discussion of relationships among organizations and their societal context on the one hand and the lives of their members on the other was presented.

AD-775 493/0GA PC$4.25/MF$1.45
Army War Coll Carlisle Barracks Pa
LEADERSHIP: THE INDIRECT APPROACH.
Student essay,
Robert F. Pfaff. 1 Nov 70, 25p

Descriptors: *Leadership, Reviews.

The purpose of the essay is to examine the advantages, and results of the indirect approach in leadership. The evolution of this concept from earliest times is briefly traced. The changes with regard to the function of the leader, caused by the technological advances of today, the desirable responses of the Government, the Army, to these changes, are analyzed. The opportunities for effective leadership are presented.

JPRS-61146 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
SOME PROBLEMS OF PREDICTING THE ACTIVITY OF MAN IN EXTREME STATES,
V. V. Suvorova. 5 Feb 74, 13p
Trans. of Voprosy Psikhologii (USSR) n4 p34-41 1973.

Descriptors: *Stress(Psychology), *Personality, *Psychophysiology, Behavior, Emotions, Responses, Predictions, Translations, USSR.

The report contains a review of methods used to predict stressful states by determining the psychophysiological characteristics of the person.

PB-228 676/3GA PC$9.00/MF$1.45
Human Interaction Research Inst., Los Angeles, Calif.
A SOURCEBOOK FOR MENTAL HEALTH MEASURES.
Final rept.,
Andrew L. Comrey, Thomas E. Backer, and Edward M. Glaser. Sep 73, 438p*
Grant PHS-MH-19611
Report on A Taxonomy of Data-collecting Devices.

Descriptors: *Psychological tests, *Test construction(Psychology), *Psychometrics, Abstracts, Bibliographies.

This volume presents over 1000 nonevaluative abstract descriptions of rating scales, questionnaires, tests, and other measuring instruments of possible utility in mental health related research. Each abstract is limited to approximately 300 words and contains directions for obtaining further information about the instrument described. Most of the measures described are unpublished, available only through small publishers, or otherwise not well known. Widely used instruments available through well advertised channels have been omitted. A brief guide to other sources of test information also is contained in the volume.

PB-228 901/5GA PC$10.00/MF$1.45
Harris (Louis) and Associates, Inc., New York.
A SURVEY OF THE ATTITUDES AND EXPERIENCE OF OCCUPANTS OF URBAN FEDERALLY SUBSIDIZED HOUSING.
Draft rept.
Jul 73, 139p HUD-PDR-005-c
Contract HUD-H-2089
Prepared by Department of Housing and Urban Development.

Descriptors: *Demographic surveys, *Residential buildings, *Grants, *Federal budgets, Attitudes, Experience, Opinions, Urban areas, Questionnaires.
Identifiers: *Subsidized housing, Standard metropolitan statistical areas, *Housing and urban development research.

The objective of this survey is to obtain data on the attitudes of occupants of subsidized housing concerning their understanding of their housing subsidy, their evaluations of the programs which provide it, and their support for alternative approaches to subsidized housing. Only data on urban subsidized housing is included, that is, housing in standard metropolitan statistical areas.

PB-228 903/1GA PC$11.75/MF$1.45
Harris (Louis) and Associates, Inc., New York.
A STUDY OF PUBLIC ATTITUDES TOWARD FEDERAL GOVERNMENT ASSISTANCE FOR HOUSING FOR LOW INCOME AND MODERATE INCOME FAMILIES.
Draft rept.,
Jul 73, 171p HUD-PDR-005-b
Contract HUD-H-2089

Descriptors: *Residential buildings, *Public opinion, *Demographic surveys, *Government policies, Attitudes, Ethnic groups, Federal budgets, Statistical data, Services, Classifications.
Identifiers: *Low income families, *Moderate income families, *Housing and urban development research.

The objective of the survey was to obtain data on the attitudes of the American public towards federal government housing policies and programs. Methodology is explained, and a summary is provided. The study describes what kind of housing Americans actually have, and how they assess their conditions; it defines the size and nature of the public mandate for housing assistance, and tells what the public specifically wants the federal government to do in the housing field.

PB-229 339/7GA PC$6.50/MF$1.45
University of Southern California, Los Angeles. Dept. of Electrical Engineering.
COMPUTER VIGNETTES. IV: THE SEDUCTIVE PATIENT.
Technical rept.,
Charlene P. Kell, and Winthrop C. Hopgood. Mar 73, 70p TR-RB73-7
NAS-GM-16197-05
Prepared in cooperation with National Institutes of Health, Bethesda, Md. Errata inserted.

Descriptors: *Computer programming, *Clinical psychology, *Psychotherapy, Simulation, Therapy.

In this vignette the therapist interviews a patient who presents a particularly difficult problem. The patient is very good looking, and her manner is seductive. She obviously enjoys playing the game of seduction with men and knows how to make it enjoyable for them too. The therapist, in order to help the patient with her underlying problems, must retain his professional identity in the relationship which is developing between them. This paper is the fourth in a series of computer simulations of the early stages of patient-therapist interaction in an initial psychotherapy interview. The program is a branching one in which each patient response is related to the last therapist response and vice versa. Following the patient response, two therapist response options are presented, one which will lead to a successful interview and one which will not. All responses, therapist's options and patient's responses, are presented by print-out on a screen similar to a video screen. (Modified author abstract)

5K. Sociology

AD-775 469/0GA PC$4.00/MF$1.45
Human Sciences Research Inc Mclean Va
MILITARY-CIVILIAN COOPERATION IN COMBATING DRUG ABUSE ON A LOCAL BASIS.
Final rept.,
K. Brown Dale. Jun 73, 93p* Rept no. HSR-RR-73/9-Oy
Contract DADA17-72-C-2081

Descriptors: *Drug abuse, Military personnel, Civilian population, Community relations, Cooperation.
Identifiers: Projects.

The report describes the background and methodology of a 12-month study of cooperative activities involving Army drug programs and programs in civilian communities adjacent to Army installations. The study involved detailed analysis, through personal interviews with Army and civilian personnel, of six specific localities in the United States to determine: whether or not drug-oriented cooperative efforts have been attempted; what is the nature of those efforts; what problems and issues have been encountered; and what problems and issues are anticipated. (Modified author abstract)

AD-775 487/2GA PC$4.00/MF$1.45
General Technical Services Inc Upper Darby Pa
APPLICATION OF SYSTEMS SCIENCE TO MAN SYSTEMS.
Contractor's interim rept. 2 Apr-1 Sep 73,
A. Iberall, S. Cardon, and A. Schindler. Sep 73, 83p
Contract DAHC19-73-C-0048
See also report dated Dec 73, AD-775 508.

Descriptors: *Systems analysis, *Sociometrics, *Physics, *Organization theory, Analog systems, Group dynamics, Kinetics, Human relations, Army research, Leadership, Barriers, Motivation.
Identifiers: *Social physics, *Man systems.

Previous study on social physics for the man-sciences is continued. In the first part, a number of essays are presented which further develop a theory of organization. Next, specific applied questions of importance to the Army are tackled. It is hoped that a real new paradigm, one drawn from the physics of organization, is recognized as being developed for application to real man-systems problems. (Modified author abstract)

AD-775 508/5GA PC$5.00/MF$1.45
General Technical Services Inc Upper Darby Pa
APPLICATION OF SYSTEMS SCIENCE TO MAN SYSTEMS.
Contractor's interim rept. no. 2, 2 Apr-31 Dec 73,
A. Iberall, and S. Cardon. Dec 73, 164p
Contract DAHC19-73-C-0048
See also report dated Sep 73, AD-775 487.

Descriptors: *Systems analysis, *Human relations, *Physics, Culture, Dynamics, Kinetic theory, Factor analysis, History, Reviews.
Identifiers: *Social physics, *Man systems.

Attempts to develop a social physics continues but need for a valid experimental data base seems essential. In a previous phase, the characteristics of a protohuman society was developed. It was concluded that a group of the order of 25 persons (10-200), a culture, roaming in a suitable area of 1000 sq. mi. was viable. Now the experimental content of history for a social physics of the past 10,000 years is explored. A two lobed distribution function results for society since the Mesolithic transition (10,000 B.C.). A full round for social kinetics is described. It involves the human elites, and the factors of technology, ecology, physiology, sociology, economics, psychology, and culture. Technology emerges as the only variable not caught up in a cyclic thermodynamic chain. (Modified author abstract)

COM-74-10507/3GA PC$3.00/MF$1.45
State Univ. of New Yor, Stony Brook. Dept. of Sociology.
PUBLIC IMAGES AND COASTAL ZONE MANAGEMENT. PART I. POLICY IMPLICATIONS.
Sea Grant program rept. (Final) 1972-73,
Andrew Collver. Jan 74, 25p NYSSGP-RS-74-001
NOAA-74020702
Contract NOAA-043-158-39

Descriptors: *Public opinion, *Coastal engineering, Environments, Natural resources, Conservation, Management planning, Sociometrics.
Identifiers: *Coastal zone management, Sea Grant program.

This is an exploratory essay on how to make sociological research more useful as a guide to action. It is directed as much to sociologists as to people who lead movements to save the wetlands, prevent oil spills or set aside coastal wildlife preserves. This essay is only one side of a dialogue and calls for response from people who try out the suggested ideas. The author points out the way public opinion seems to be tending, what its effects may be, and how the energies developed in the public may be mobilized for constructive change.

PB-228 577/3GA PC$15.00/MF$1.45
Interdepartmental Council to Coordinate All Federal Juvenile Delinquency Programs, Washington, D.C.
INTERDEPARTMENTAL COUNCIL TO COORDINATE ALL FEDERAL JUVENILE DELINQUENCY PROGRAMS FISCAL YEAR 1972.
Publication series.
1973, 858p*

Descriptors: *Juvenile delinquency, *Criminology, *Government policies, *Project planning, National government, Coordination, Objectives, Prevention, Reduction, Services, Management methods, Models, Revisions, Research, Standards.

Chapter 1 covers the Council's own activities and accomplishments in fiscal 1972. Chapter 2 presents an overview of all Federal juvenile delinquency and related youth development programs, a substantial portion of which has been adapted from the Attorney General's First Annual Report on Federal Law Enforcement and Criminal Justice Activities. The reporting requirements that deal specifically with the activities of the Youth Development and Delinquency Prevention Administration are summarized in Appendix A. Also included is a directory of federally sponsored juvenile delinquency programs. Another appendix is the Census Bureau Phase 1 Report on the nature, scope and approach of 197 programs in existence during 1971. Portions of this document are not fully legible.

PB-228 685/2GA PC-GPO/MF$1.45-NTIS
International Halfway House Association, Cincinnati, Ohio.
GUIDELINES AND STANDARDS FOR HALFWAY HOUSES AND COMMUNITY TREATMENT CENTERS.
May 73, 272p
Paper copy available from GPO $2.85 as stock no. 2700-00187.

Descriptors: *Criminology, *Rehabilitation, *Centers, *Regional planning, Community relations, Standards, Reviews, Correction, Recommendations, Juvenile delinquency, Adults, Project planning, Management, Financing.
Identifiers: *Halfway houses, Criminal justice.

The history of halfway houses in the United States is traced and their function in the criminal justice and correctional system is outlined. Guidelines are offered for planning and implementing halfway houses and community treatment centers. The guidelines include suggestions for choosing the type and location of the physical facility, obtaining the support of key community leaders, and designing programs to fit the needs of specific classes of offenders. Recommendations are presented for the training of program personnel. The major sources of funding for community treatment programs are identified and sample budgets for such programs are provided. Minimum standards are offered for application in the areas of administration, program development, and personnel.

PB-228 630/0GA PC-GPO/MF$1.45-NTIS
National Advisory Commission on Criminal Justice Standards and Goals, Washington, D.C.
CORRECTIONS - REPORT OF THE NATIONAL ADVISORY COMMISSION ON CRIMINAL JUSTICE STANDARDS AND GOALS, 1973.
1973, 641p
Grants LEAA-72-DF-99-0003, LEAA-NI-72-0201
Paper copy available from GPO $6.30.

Descriptors: *Criminology, *Revisions, *State government, *Community relations, Recommendations, Policies, Juvenile delinquents, Adults, Correction, Management planning, Rehabilitation, Project planning, Objectives.
Identifiers: Probation, Parole, *Minor offense decriminalization, Sentencing policies, Criminal justice.

The Commission urges that disparities in sentencing be removed and that justice in corrections be upheld by measures guaranteeing offender's rights during and after incarceration. The scope of corrections will be narrowed by diverting many juveniles and sociomedical cases (alcoholics, drug addicts, prostitutes, and mentally disturbed) to non-correctional treatment programs and by decriminalizing certain minor offenses such as public drunkenness and vagrancy. Probation is seen as the standard criminal sentence, retaining confinement chiefly for dangerous offenders and releasing the majority of offenders to community-based programs. Corrections should undergo a planned integration into the total criminal justice system within each state.

PB-228 631/8GA PC$3.25/MF$1.45
Wisconsin Univ., Madison. Inst. for Environmental Studies.
EDPOP: A U.S. HUMAN POPULATION SIMULATOR,
C. Richard Tracy. Oct 73, 37p IES-12 NSF-RA-E-73-024
Grant NSF-GI-29731

Descriptors: *Population growth, *Computerized simulation, United States, Mathematical models, Birth control, Factor analysis, Fertility, Dynamics, Family relations, Computer programs, Vital statistics, Reviews.
Identifiers: *EDPOP computer program.

EDPOP, a computer simulation model of U.S. human population dynamics, provides a tool for exploring the relative importance of the various factors in populational fertility control in terms of population sizes at some time in the future, growth rates of the U.S. population, age structure in projected future populations, approximate family size structures in U.S. projected populations, and other population characteristics. EDPOP also provides a tool for exploring the sometimes counterintuitive dynamics of human population changes through time. The report describes how to use the model as well as the model structure and calculations.

PB-228 651/6GA PC$8.75/MF$1.45
Wisconsin Univ., Madison. Inst. for Environmental Studies.
QUALITY OF LIFE IN KICKAPOO VALLEY COMMUNITIES,
E. A. Wilkening, J. G. Linn, D. McGrahahan, P. Wopat, and C. Geisler. Sep 73, 111p IES-11 NSF-RA-E-73-023
Grant NSF-GI-29731

Descriptors: *Dams, *Community relations, *Wisconsin, *Economic factors, *Sociometrics, Rural areas, Human ecology, Social change, Economic analysis, Public opinion, Interviews, Recreation, Facilities, Transportation, Questionnaires.
Identifiers: *Quality of life, Kickapoo Valley(Wisconsin), La Farge Dam.

The report is the second in a series dealing with the economic and social impact of the La Farge Dam on the Kickapoo River in Southwestern Wisconsin. The first report (EIS Report 6) was a study of outdoor recreation activities in the Upper Kickapoo Valley. The present report represents the results of a baseline study of the social and economic characteristics of the counties and communities affected by the dam. It illustrates a method for the measurement of the impact of the dam upon people and institutions, using secondary sources and data collected by personal interviews with community leaders.

PB-228 663/1GA PC$11.00/MF$1.45
Iowa Judicial District (5th), Des Moines. Dept. of Court Services.
A HANDBOOK ON COMMUNITY CORRECTIONS IN DES MOINES. A COORDINATED APPROACH TO THE HANDLING OF ADULT OFFENDERS.
1974, 157p
Sponsored in part by Law Enforcement Assistance Administration, Washington, D.C.

Descriptors: *Criminology, *Iowa, *Adults, Correction, Community relations, Handbooks, Models, Project planning, Methodology, Improvement, Personnel management, Supervision, Rehabilitation.
Identifiers: *Adult offenders, *Des Moines(Iowa), Criminal justice, Pretrial, Probation, Parole.

Written as a handbook for local officials and planners, the manual presents a model of a program providing alternatives to the traditional institutions of the criminal justice system. The services provided by the program and described in the manual include pre-trial release on recognizance for low-risk defendants, pre-trial supervision for defendants considered to be greater non-appearance risks, probation supervision and pre-sentence investigation, and residential treatment. Of particular interest to officials is the emphasis on performance evaluation and the cost-saving use of existing community services and resources. Other features are the balanced use of professional and paraprofessional staff and a non-therapeutic, highly practical treatment approach used in all components of the program. (Modified author abstract)

PB-228 779/5GA PC$9.25/MF$1.45
Maryland Governor's Commission on Law Enforcement and the Administration of Justice.
COMPREHENSIVE PLAN 1974. VOLUME I.
1 Jan 74, 433p LEAA-MD-74-006

Descriptors: *Criminology, *Maryland, *Regional planning, Rehabilitation, Law enforcement, State government, Juvenile delinquency, Project planning, Problem solving, Objectives, Adults, Police, Specialized training, Demography, Statistical distributions, Urban areas, Prevention, Participative management, Methodology.
Identifiers: *Crime reduction, *Criminal justice, Citizen participation.

The reported plan is intended to form the basis for improvements in both the adult and juvenile justice system. It has been designed to place emphasis on reducing crime and improving the operations of the system. The methods employed for collecting and analyzing data, the setting of objectives and priorities, and the development of the annual action and multi-year plans are discussed. Crime and delinquency in Maryland are examined with special emphasis on criminal statistics. The major problems confronting Maryland's criminal justice are reviewed in relation to specific types of jurisdictions and their unique needs.

PB-228 866/0GA PC$5.50/MF$1.45
Harvard Univ., Cambridge, Mass.
BACKGROUND PAPER ON HOUSING MARKET DISCRIMINATION AND ITS IMPLICATIONS FOR GOVERNMENT HOUSING POLICY.
National Housing policy papers,
John F. Kain. 24 May 73, 48p HUD-PDR-112

Descriptors: *Residential buildings, *Marketing, *Discrimination, Reviews, Ethnic groups, Separation, Government policies, Economic surveys, Recommendations, Quality.
Identifiers: Racial discrimination, Housing segregation.

The direct and indirect effects of racial discrimination in urban housing markets on the welfare of white and black Americans, on the efficiency of metropolitan growth, and on the effectiveness of other government programs are difficult to describe. Some are well established and uncontroversial. Others are poorly documented or are subject to debate. It is important to articulate these effects because discrimination, along with poverty, is largely responsible for the unsatisfactory outcomes produced by urban housing markets; it provides a major justification for government intervention.

PB-228 867/8GA PC$5.75/MF$1.45
Urban Land Inst., Washington, D.C. Research Div.
HOUSING REHABILITATION NEEDS AND FEDERAL SUPPORT FOR HOUSING REHABILITATION PROGRAMS.
Final rept.,
Donald E. Priest, and Edward E. Murray. 12 Jun 73, 55p HUD-PDR-304
Grant HUD-H-5064

Descriptors: *Residential buildings, *Project planning, Maintenance, Urban areas, Rural areas, Blighted areas, Community development, Financial management.
Identifiers: *Housing and urban development research.

The report discusses reasonable levels of preservation and rehabilitation of houses which can be obtained within the context of alternative realistic national housing goals. It presents a discussion of parameters, assumptions, and constraints considered in determining the rehabilitation goals.

PB-228 888/4GA PC$10.00/MF$1.45
Housing Assistance Council, Inc., Washington, D.C.
AN ANALYSIS OF RURAL REPAIR AND REHABILITATION PROGRAMS.
Final rept.,
Gordon Cavanaugh. 22 Jun 73, 136p HUD-PDR-301
Contract HUD-H-2098

Descriptors: *Housing restoration, *Rural areas, *Project planning, Rehabilitation, Recommendations, Repair services, United States, American Indians, Socioeconomic status, Loans.
Identifiers: *Low income families, *Housing and urban development research.

The analysis draws a number of conclusions regarding rural rehabilitation needs, gaps and future prospects. These conclusions make sense only within the special conditions of rural America. There is also an attempt to offer recommendations of both a general and specifically programmatic nature based on the conclusions.

PB-228 889/2GA PC$7.00/MF$1.45
National Urban League Development Foundation, Washington, D.C.
ISSUES IN EQUAL ACCESS TO HOUSING UNDER REVENUE SHARING PROGRAMS, HOUSING ALLOWANCE PROGRAMS, PRODUCTION ORIENTED PROGRAMS, AND HOUSING PRESERVATION PROGRAMS.
Final rept.,
6 Aug 73, 76p HUD-PDR-403
Contract HUD-H-2113

Descriptors: *Residential buildings, Federal budgets, Availability, Projects, Recommendations, Allowances, Policies, Urban areas.
Identifiers: Revenue sharing, Alternatives, *Housing and urban development research.

Two general categories of issues are being addressed regarding equal access to housing: Civil rights and affirmative action to achieve equitable results. The report is in four sections: Issues and recommendations: Equal access to housing under revenue sharing programs, equal access to housing under housing allowances programs, equal access to housing under production, and equal access to housing under housing preservation programs. In each of the issue papers, equal access issues are presented as they apply to the respective alternative program area and as they apply operationally to the principal current proposals relevant to each alternative.

PB-228 890/0GA PC$6.50/MF$1.45
Yale Univ., New Haven, Conn. Dept. of Psychology.
EFFECTS OF HOUSING ON MENTAL AND PHYSICAL HEALTH.
National Housing policy study papers,
Stanislav V. Kasl. 30 Jun 73, 66p HUD-PDR-105

Descriptors: *Residential buildings, *Public health, *Mental hygiene, Psychometrics, Demographic surveys, Urban areas, Neighborhoods, Environments, Relocation, Behavior.
Identifiers: Satisfaction, *Housing and urban development research.

The major purpose of this report is to review the empirical evidence regarding the effects of various physical parameters of housing on behavior and mental and physical health. A secondary objective is to derive conclusions regarding the probable consequences of changes or improvements in various aspects of housing.

PB-228 891/8GA PC$4.50/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
EVALUATION OF PROPOSED ELDERLY CONDOMINIUM PROGRAM.
Draft rept.,
Sheldon L. Baskin. 15 Jun 73, 28p HUD-PDR-434

Descriptors: *Residential buildings, *Reference groups, *Aging(Biology), *Project planning, Construction, Incentives, Economic factors, Financing, Statistical data, Retirement, Evaluation.
Identifiers: *Housing and urban development research, *Condominiums, *Elderly persons.

The report studies the various aspects of buildings condominium homes for the elderly, minimum age 55, as well as what incentives could be given to builders to produce these cheaply enough for elderly retired persons to purchase, who can not afford to keep up large old homes. The advantages and disadvantages of such a program are studied, including how the financing would be handled.

PB-228 902/3GA PC$6.00/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
A RATIONALE FOR GOVERNMENT INTERVENTION IN HOUSING: IMPACT OF GOVERNMENT NON-HOUSING POLICIES ON THE HOUSING AND MORTGAGE MARKETS.
Draft rept.,
David D. Ramsey, and George Vredeveld. 1973, 59p HUD-PDR-126
Prepared by David D. Ramsey, and George Vredeveld.

Descriptors: *Residential buildings, *Marketing, *Government policies, Stabilization, Taxes, Labor relations, Transportation, Urban renewal, Industrial relations, State government, National government, Local government.
Identifiers: Government intervention, *Housing and urban development research, *Mortgages.

The purpose of the study is to identify policy variables that influence housing goals and to specify the impacts that non-housing policies have on those instrument variables and ultimately on the impacts of federal housing goals. The authors examine stabilization policies, federal tax policies, labor-manpower policies, transportation, urban renewal, timer industry policies, and state and local governmental policies.

PB-228 904/9GA PC$5.50/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
REHAB PROGRAM ALTERNATIVES.
Draft rept.,
Peter R. Morris. 27 Jun 73, 47p HUD-PDR-408-a
Prepared by Robert R. Morris.

Descriptors: *Residential buildings, *Maintenance, *Federal budgets, Grants, Leasing, Project planning, Rehabilitation, Government policies, Regulations.
Identifiers: *Housing and urban development research, Arbitrage, *Home improvements.

The study cites alternative sources of low cost government funds for home improvements, explains changes in arbitrage regulations, examines a production approach to rent supplements, and offers an outline of a suggested policy of government ownership with private control.

PB-228 966/8GA PC$6.75/MF$1.45
Gadsby and Hannah, Washington, D.C.
IMPACT OF JUDICIAL AND ADMINISTRATIVE DECISIONS ON LEGISLATIVE POLICY DEVELOPMENT AND IMPLEMENTATION OF HOUSING PROGRAMS.
Final rept.,
Ashley Foard, and John M. Frantz. 7 Jul 73, 74p HUD-PDR-101-c
Contract HUD-H-2092

Descriptors: *Housing projects, *Federal programs, *Legislation, *Government policies, Decision making, Impact, Trends, Reviews, Management analysis, Forecasting.
Identifiers: Judicial decisions, *Housing and urban development research.

The report is presented in two sections: Section 1 covers a number of broad legal areas which are significant to housing legislation and programs; briefly traces the major trends of key decisions in these areas and their most significant holdings;

and cites these and selected related cases which will be helpful to anyone wishing to pursue one or more of these areas in greater depth. Section 2 presents and briefly analyzes the major administrative decisions relating to housing, and illustrates how in quite different ways they came to have sweeping effects on program operations, on the impacts of programs on the housing industry and the public, and on the cause of future legislation.

PB-228 980/9GA PC$4.50/MF$1.45
Barton-Aschman Associates, Inc., Chicago, Ill.
CODE ENFORCEMENT AND REHABILITATION.
Aug 73, 30p HUD-PDR-309

Descriptors: *Residential buildings, *Project planning, *Building codes, Maintenance, Renovating, Urban renewal, Inspection.
Identifiers: *Housing and urban development research.

The paper discusses how code enforcement programs might be expected to achieve property rehabilitation. The current state of the art of code enforcement as it pertains to rehabilitation is described. Code enforcement as a prospective tool in relation to rehabilitation is evaluated.

PB-228 985/8GA PC$5.00/MF$1.45
McKinsey and Co., Inc., Washington, D.C.
ANALYZING TRENDS IN HOUSING CONSTRUCTION AND OPERATING COSTS.
Aug 73, 171p*
Contract HUD-H-2115

Descriptors: *Housing studies, *Trends, *Cost analysis, Construction costs, Land, Financing costs, Taxes, Utilities, Maintenance, Single family houses, Insurance, Central city, Urbanized areas, Suburban areas, Rural areas, Neighborhoods, Mobile homes.
Identifiers: Stick built housing, Multifamily dwellings, *Housing and urban development research.

The purpose of the report is to identify the trends that have been occurring in the cost of housing in the United States, particularly over the last five years. In analyzing the cost of both conventional stick-built housing and mobile homes, attention was focused on trends occurring in the: (1) Major components of housing cost-land, construction, financing, taxes, utilities, maintenance and insurance; (2) four Census Regions - Northeast, North Central, South and West; (3) four types of neighborhoods as classified by HUD--core city, other city, suburban, and rural; and (4) different sized cities--larger versus smaller.

PB-228 986/6GA PC$4.50/MF$1.45
Little (Arthur D.), Inc., Cambridge, Mass.
CONSUMER PREFERENCES IN HOUSING.
Final rept.
2 Jul 73, 124p* HUD-PDR-008

Descriptors: *Residential buildings, *Information systems, *Public relations, Statistical data, Opinions, Reviews, Consumers, Attitudes, Structural design, Requirements, Factor analysis, Classifications, Neighborhoods, Prices.
Identifiers: *Housing and urban development research, Preferences, Satisfaction levels.

The study uses both statistical data and informed expert opinion to identify consumer preference changes in housing. Possible benefits for government agencies, private industry and consumers from more complete information on consumer preferences are identified.

PB-228 995/7GA PC$4.50/MF$1.45
McKinsey and Co., Inc., Washington, D.C.
ANALYZING TRENDS IN THE HOUSING INDUSTRY.
Final rept.
Aug 73, 111p*
Contract HUD-H-2115

Descriptors: *Housing studies, *Production trends, *Industrial outlook, Government industry relationships, Policies, Single family houses, Mobile homes, Technological change, Structural design, Housing market.
Identifiers: *Housing and urban development research, Multifamily dwellings.

The report attempts to compile and report the facts, to analyze major trends, and to form a solid basis for future government actions concerning housing production in the United States. The information presented is extensive and the report studies both existing patterns and emerging trends, or changes in the patterns. Several issues are discussed which may be helpful to policy makers in shaping the future of housing production.

PB-229 107/8GA PC$6.25/MF$1.45
Abt Associates, Inc., Cambridge, Mass.
HOUSING INFORMATION SERVICES.
Final rept.
31 May 73, 65p AAI-432
Contract HUD-H-2091-R

Descriptors: *Housing research, *Information systems, *Consumer services, Subsidy programs, Federal programs, Handbooks.
Identifiers: *Housing and urban development research, Information services.

The purpose of the report is to outline a coherent package of housing information services for consumers, provided as a complement to the alternative housing subsidy programs being developed by the Housing Study Task Force of the Department of Housing and Urban Development.

PB-229 108/6GA PC$3.25/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
EVALUATION OF PROPOSED SHALLOW SUBSIDY RENTAL HOUSING PRODUCTION PROGRAM.
Final rept.,
Sheldon L. Baskin. 15 Jun 73, 38p* HUD-PDR-423-b

Descriptors: *Rental housing, *Subsidies, *Project planning, Evaluation, Economic analysis, Housing market analysis, Management systems, Attitudes, Housing studies, Housing planning.
Identifiers: *Housing and urban development research.

The objective of the paper is to evaluate a proposed shallow subsidy rental housing production program (RHPP) from the point of view of the housing developer, the lender, the investor and the marketing and management function. The program is described and analyzed from the point of view of each of these things in the development process.

PB-229 214/2GA PC$6.00/MF$1.45
Harvard-MIT Joint Center for Urban Studies, Cambridge, Mass.
IMPLICATIONS OF THE EXPERIENCE WITH THE SHELTER COMPONENT IN PUBLIC ASSISTANCE FOR THE DESIGN OF A NATIONAL HOUSING ALLOWANCE.
Draft rept.,
David M. Austin. 15 Jun 73, 59p HUD-PDR-414-b

Descriptors: *Residential buildings, *Project planning, *Shelters, Finance, Government.
Identifiers: *Housing and urban development research, Public assistance.

The paper deals with three questions of importance in the design of a national housing allowance program. (1) Has the experience with the shelter component in public assistance programs constituted an effective test of a national housing allowance; (2) to what extent could the shelter component provisions in public assistance programs be used as an alternative to a national housing allowance; (3) what are the implications of the experience with the shelter component in public assistance for the design of a national allowance program.

PB-229 216/7GA PC$4.75/MF$1.45
Harvard-MIT Joint Center for Urban Studies, Cambridge, Mass.
A PRELIMINARY MEMORANDUM ON INTERFACE ISSUES BETWEEN A NATIONAL HOUSING ALLOWANCE AND EXISTING PUBLIC ASSISTANCE PROGRAMS. APPENDIX K.
Draft rept.,
David Austin. 22 Jun 73, 31p HUD-PDR-414-c

Descriptors: *Residential buildings, *Project planning, Finance, Government.
Identifiers: *Housing and urban development research, Public assistance.

The memorandum is a preliminary outline of a range of interface issues which may emerge between a national housing allowance and existing public assistance programs, particularly federal-state categorical programs. It does not deal with those interface issues involving the determination of actual cash benefits for households enrolled simultaneously in a housing allowance program and public assistance or with the treatment of earned income. The memo includes a proposal for more detailed analysis of these issues takingnto account the actual differences among categorical programs and among the several states.

PB-229 219/1GA PC$3.25/MF$1.45
Virginia Polytechnic Inst. and State Univ., Blacksburg.
THE IMPACT OF COUNTER-CYCLICAL MONETARY AND FISCAL POLICIES ON HOUSING.
National Housing policy study papers,
David I. Meiselman. 15 Jun 73, 42p* HUD-PDR-135

Descriptors: *Residential buildings, *Finance, *Government policies, Reviews.
Identifiers: *Housing and urban development research.

The report examines some of the rationale often advanced for the special treatment of housing stemming from the contention that tools of the monetary and fiscal policy aimed at general economic stabilization have specific impacts on housing that are differentially severe and discriminatory. The alleged discrimination against housing construction expenditures is then taken to justify special and compensatory treatment of housing under a wide range of federal government programs. The report examines whether the usual tools of counter-cyclical monetary and fiscal policy discriminate against housing. The report concludes that discrimination against housing does not appear to occur.

PB-229 356/1GA PC$3.75/MF$1.45
National Analysts, Inc., Philadelphia, Pa.
FAMILY PLANNING STUDY. VOLUME I. EXECUTIVE SUMMARY.
Final rept. 30 Jun 70-15 Jun 73,
Marshall Greenberg, Gerald Robin, and Jack Schwartz. Jun 73, 63p* OEO-LN-1416
Contract OEO-B0O-5182
Paper copy also available from NTIS $32.00/set of 4 volumes as PB-229 355-SET.

Descriptors: *Birth control, Government policies, Fertility, Contraceptives, Demographic surveys, Socioeconomic status, Attitudes.
Identifiers: *Family planning.

The study determines the impact of federally-supported family planning programs in terms of patient satisfaction with services, utilization of

federally-assisted family planning projects, program effect on contraceptive behavior, the need for federal assistance in providing family planning services, and the reduction of unwanted pregnancies.

PB-229 357/9GA PC$3.75/MF$1.45
National Analysts, Inc., Philadelphia, Pa.
FAMILY PLANNING STUDY, VOLUME II. RESEARCH DESIGN AND METHODOLOGY.
Final rept. 30 Jun 70-15 Jun 73.
Jun 73, 54p* OEO-LN-1417
Contract OEO-B0O-5182
Paper copy also available from NTIS $32.00/set of 4 volumes as PB-229 355-SET.

Descriptors: *Birth control, Government policies, Fertility, Contraceptives, Demographic surveys, Socioeconomic status, Attitudes.
Identifiers: *Family planning.

Contents:
Development of the methodology;
Design and execution of list sample phase;
Design and execution of the area probability phase;
Family planning project data.

PB-229 358/7GA PC$5.50/MF$1.45
National Analysts, Inc., Philadelphia, Pa.
FAMILY PLANNING STUDY. VOLUME III. CHAPTER 1. DEMOGRAPHIC CHARACTERISTICS. CHAPTER 2. SOURCES OF FAMILY PLANNING SERVICE.
Final rept. 30 Jun 70-15 Jun 73.
Jun 73, 176p* OEO-LN-1418
Contract OEO-B0O-5182
Paper copy also available from NTIS $32.00/set of 4 volumes as PB-229 355-SET.

Descriptors: *Birth control, Government policies, Fertility, Contraceptives, Demographic surveys, Socioeconomic status, Attitudes.
Identifiers: *Family planning.

Contents:
Demographic characteristics of the list sample;
Comparison of list sample women with all women attending federally-funded family planning projects;
Comparison of list sample and national fertility survey respondents;
Demographic characteristics of the Harlem/Lower Bronx area probability sample;
Comparison of selected demographic variables in the list sample and Harlem/Lower Bronx area probability sample.

PB-229 359/5GA PC$6.50/MF$1.45
National Analysts, Inc., Philadelphia, Pa.
FAMILY PLANNING STUDY. VOLUME III. CHAPTER 4. CONTRACEPTIVE BEHAVIOR AND ATTITUDES.
Final rept. 30 Jun 70-15 Jun 73.
Jun 73, 257p* OEO-LN-1420
Contract OEO-B0O-5182
Paper copy also available from NTIS $32.00/set of 4 volumes as PB-229 355-SET.

Descriptors: *Birth control, Government policies, Fertility, Contraceptives, Demographic surveys, Socioeconomic status, Attitudes.
Identifiers: *Family planning.

Contents:
Contraceptive behavior of list sample by respondent characteristics;
Contraceptive behavior and attitudes in Harlem and Lower Bronx, New York, by respondent characteristics.

PB-229 360/3GA PC$4.50/MF$1.45
National Analysts, Inc., Philadelphia, Pa.
FAMILY PLANNING STUDY. VOLUME III. CHAPTER 3. FERTILITY BEHAVIOR. CHAPTER 5. COMMUNITY GENERAL HEALTH CARE.
Final rept. 30 Jun 70-15 Jun 73.
Jun 73, 111p* OEO-LN-1419
Contract OEO-B0O-5182
Paper copy also available from NTIS $32.00/set of 4 volumes as PB-229 355-SET.

Descriptors: *Birth control, Government policies, Fertility, Contraceptives, Demographic surveys, Socioeconomic status, Attitudes.
Identifiers: *Family planning.

Contents:
General fertility behavior;
Fertility behavior related to source of service.

PB-229 361/1GA PC$5.50/MF$1.45
National Analysts, Inc., Philadelphia, Pa.
FAMILY PLANNING STUDY. VOLUME III. CHAPTER 6. SOURCES OF SERVICE: PATIENT SATISFACTION. CHAPTER 7. PROGRAM CONTINUATION AND ATTRITION. CHAPTER 8. PROJECT COST CHARACTERISTICS.
Final rept. 30 Jun 70-15 Jun 73.
Jun 73, 198p* OEO-LN-1421
Contract OEO-B0O-5182
Paper copy also available from NTIS $32.00/set of 4 volumes as PB-229 355-SET.

Descriptors: *Birth control, Government policies, Fertility, Contraceptives, Demographic surveys, Socioeconomic status, Attitudes.
Identifiers: *Family planning.

Contents:
Components of satisfaction;
Preferred gender of physician;
Transportation to clinic;
Prefer different clinic hours;
Patients' awareness of clinic services;
Reasons for terminating source use.

PB-229 362/9GA PC$9.25/MF$1.45
National Analysts, Inc., Philadelphia, Pa.
FAMILY PLANNING STUDY. VOLUME IV. DATA GATHERING INSTRUMENTS.
Final rept. 30 Jun 70-15 Jun 73.
Jun 73, 456p* OEO-LN-1422
Contract OEO-B0O-5182
Paper copy also available from NTIS $32.00/set of 4 volumes as PB-229 355-SET.

Descriptors: *Birth control, Government policies, Fertility, Contraceptives, Demographic surveys, Socioeconomic status, Attitudes.
Identifiers: *Family planning.

Contents:
Project and clinic services questionnaire;
Show cards associated with project and clinic services questionnaire;
Cost accounting questionnaire;
Interviewers' study manual for clinic user study;
Area probability questionnaire;
Screening form for area probability study.

PB-229 413/0GA PC$5.00/MF$1.45
College of William and Mary, Williamsburg, Va. Metropolitan Criminal Justice Center.
COLLEGE OF WILLIAM AND MARY. METROPOLITAN CRIMINAL JUSTICE CENTER.
Interim rept.
9 Oct 73, 37p

Descriptors: *Law enforcement, *Information systems, Crimes, Law enforcement, Juvenile deliquency, Virginia, Police.
Identifiers: *Criminal justice, Courts of law.

Demonstration projects, research, technical assistance and other pilot city program activities in Chesapeake, Norfolk, Portsmouth, and Virginia Beach, Virginia are described. Demonstration projects such as the following are discussed -- the Chesapeake Police Youth Services Unit, the Norfolk model probation services, the Norfolk Police Planning and Analysis office, and the Portsmouth juvenile court specialized services-behavior modification project. Research and technical assistance activities described include redesigning the Norfolk Police Beat structure, the Chesapeake comprehensive youth development program, COPPS -- a computer oriented police planning system, a criminal justice attitude and victimization survey, and the Virginia Beach Model Juvenile Bureau.

PB-229 414/8GA PC$7.00/MF$1.45
College of William and Mary, Williamsburg, Va. Metropolitan Criminal Justice Center.
COLLEGE OF WILLIAM AND MARY METROPOLITAN CRIMINAL JUSTICE CENTER. PILOT CITY PROJECT.
Final rept. 8 Sep 71-7 May 73.
7 May 73, 77p
Grant LEAA-NI-72-005-G

Descriptors: *Law enforcement, *Information systems, Crimes, Law enforcement, Juvenile delinquency, Virginia, Police.
Identifiers: *Criminal justice, Courts of law.

Steps taken to meet principal tasks during the first twenty months of a projected five year pilot city program included the development of baseline data and identification of the needs of the system. Research projects concerned such issues as probation, delinquency probation, and family intervention. Plans were also set forth for a juvenile justice information system. Additional material in this document describes proposals for five demonstration projects. These include a youth service unit for the Chesapeake Police Department, a volunteer program for the Portsmouth juvenile and domestic relations court, and a juvenile based transactions statistics information system for Norfolk and Chesapeake. The final application for funding proposes a model probation services program for the Norfolk juvenile and domestic relations court.

PB-229 489/0GA PC$4.25/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
STANDARDS FOR RESIDENTIAL REHABILITATION,
M. Carter McFarland. 18 Jan 74, 23p HUD-PDR-433

Descriptors: *Residential buildings, Rehabilitation, Standards, Reviews, Substitutes, Evaluation.
Identifiers: *Rehabilitation standards, *Housing and urban development research.

The report deals with HUD's rehabilitation standards which were set up in May 1963 (HUD PG 50) and do not constitute rehabilitation standards per se, but rather a guide for establishing rehabilitation standards. This report examines these standards and studies alternatives to these standards. The conclusion is that HUD PG 50 is a sound, realistic base which only needs revision.

6. BIOLOGICAL AND MEDICAL SCIENCES

6A. Biochemistry

AD-774 813/0GA PC$3.25/MF$1.45
Edgewood Arsenal Aberdeen Proving Ground Md
CHOLINE: HIGH AFFINITY TRANSPORT INTO SYNAPTOSOMES OF RAT BRAIN.
Technical rept. Aug 71-Mar 73,
Henry I. Yamamura, Tommy L. Gardner, Louis A. Fedele, and Lea M. Somers. Feb 74, 33p Rept no. EB-TR-73058

Descriptors: *Cholines, *Brain, Acetylcholine, Cerebellum, Cerebral cortex, Accumulation, Absorption(Biological), Transport properties.
Identifiers: Corpus striatum.

The accumulation of (3H) choline into synaptosome-enriched homogenates of rat corpus striatum, cerebral cortex, and cerebellum was studied at (3H) choline concentrations varying from 0.5 to 100 micrometers M. The accumulation of (3H) choline in these brain regions was saturable. Kinetic analysis of the accumulation of the radiolabel was performed by double-reciprocal plots and by least-squares iterative fitting of a substrate-velocity curve to the data. With both of these techniques, the data were best satisfied by two transport components, a high-affinity uptake system with Km values of 1.4 micrometers M (corpus striatum), and 3.1 micrometers M (cerebral cortex), and a low-affinity uptake system with Km values of 93 and 33 micrometers M for these two brain regions. In the cerebellum, choline was accumulated only by the low-affinity system. When striatal homogenates were fractioned further into synaptosomes and mitochondria and incubated with varying concentrations of (3H) choline, the high-affinity component of choline uptake was localized to the synaptosomal fraction. A variety of evidence suggests that the high-affinity transport represents a selective accumulation of choline by cholinergic neurons, while the low-affinity uptake system has some less specific function. (Modified author abstract)

AD-774 977/3GA Reprint
Johns Hopkins Univ Baltimore Md Dept of Microbiology
THE MOLECULAR DIMENSIONS OF GUINEA PIG LYMPHOTOXIN,
Maurice K. Gately, and Manfred M. Mayer. 30 Jul 73, 12p
Contract N00014-67-A-0163-0014, Grant NSF-GB-7406
Availability: Pub. in the Jnl. of Immunology, v112 n1 p168-177 Jan 74.

Descriptors: *Lymphatic system, *Toxins and antitoxins, Cells(Biology), Toxicity, Molecular properties, Purification, Guinea pigs, Experimental data.
Identifiers: *Lymphotoxins.

The molecular dimensions of guinea pig lymphotoxin were studied by means of gel filtration, sucrose density gradient ultracentrifugation, and CsCl isopycnic ultracentrifugation. Lymphotoxin was produced by stimulating immune lymph node cells with the specific antigen, ovalbumin, and was assayed by means of a Coulter counter microassay. No evidence was found to indicate that more than a single factor was involved in producing the cytotoxic effect attributed to lymphotoxin. (Modified author abstract)

AD-775 034/2GA Not available NTIS
National Research Council of Canada Ottawa (Ontario) Div of Biological Sciences
THE EFFECTS OF MALEYLATION ON THE PROPERTIES OF CONCANAVALIN A,
N. Martin Young. 19 Jun 73, 7p NRC-13671
Availability: Pub. in the Biochimica et Biophysica Acta, v336 p46-52 1974.

Descriptors: *Proteins, Chemical properties, Chemical analysis, Canada.
Identifiers: *Phytohemagglutinin, *Concanavalin A, *Maleic anhydride.

The major product resulting from treatment of concanavalin A with maleic anhydride is a stable, dimeric species, devoid of subunits with broken peptide chains. For complete dissociation of the concanavalin A tetramer, at least eight maleyl groups per subunit were required. The binding site in the fully modified protein was shown to be essentially unchanged, by equilibrium dialysis experiments with para-nitro-phenyl-alpha-D-glucoside. Precipitation reactions with dextran were altered, and would only proceed in the presence of high salt concentration at acid pH. Affinity chromatography on Sephadex G-75 showed that the maleylated dimer behaved in a similar manner to the dimeric form of concanavalin A. (Author)

AD-775 035/9GA Not available NTIS
National Research Council of Canada Ottawa (Ontario) Div of Biological Sciences
CLOSED CIRCULAR DNA ASSOCIATED WITH YEAST MITOCHONDRIA,
L. Zeman, and C. V. Lusena. 15 Oct 73, 4p NRC-13679
Availability: Pub. in the FEBs Letters, v38 n2 p171-174 Jan 74.

Descriptors: *Deoxyribonucleic acids, *Mitochondria, *Yeasts, Biophysics, Molecular properties, Nuclei, Cytoplasm, Cells(Biology), Canada.
Identifiers: Molecular biology.

The results reported show that the in vivo labelling of the DNA circles of nuclear density is inhibited by cycloheximide in analogy with the behavior of the nuclear and not the mitochondrial DNA. Contrary to some reports, however, the circular DNA fraction also contains DNA of mitochondrial density.

N74-14825/5GA PC$3.00/MF$1.45
Scripta Publishing Corp., Washington, D.C.
THE EFFECT OF PHYSICAL EXERCISE ON BINDING OF CORTICOSTEROIDS BY TRANSCORTIN IN PLASMA.
A. F. Bunyatyan, and V. P. Erez. Jan 74, 10p
NASA-TT-F-15258
Contract NASW-2484
Tran-Transl. Into English from Prob. Endok. (Moscow), V. 18, 1972 p 13-17.

Descriptors: *Blood plasma, *Clinical medicine, *Exercise (Physiology), *Steroids, Athletes, Hormones, Physical fitness, Proteins.

For abstract, see STAR 1206

N74-14827/1GA PC$3.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
DRUG METABOLISM AND FOREIGN MATTER HYDROXYLASE (CYTOCHROME P-450) IN SEVERE HEPATIC DAMAGE IN MAN.
H. F. Vonoldershausen, B. Schoene, H. Held, H. P. Menz, and R. A. Fleischmann. Jan 74, 11p
NASA-TT-F-15276
Contract NASW-2481
Tran-Transl. Into English from Z. Gastroenterol. (West Ger.), V. 11, 1973 p 403-410.

Descriptors: *Liver, *Metabolism, Cytochromes, Drugs, Enzymes, Ethyl alcohol.

For abstract, see STAR 1206

PB-227 849/7GA PC$4.00/MF$1.45
Case Western Reserve Univ., Cleveland, Ohio. Dept. of Microbiology.
HYDROGEN PRODUCTION BY PHOTOSYNTHESIS AND HYDROGENASE ACTIVITY,
L. O. Kampitz. 12 Oct 72, 10p NSF-RA/N-73-013
Grant NSF-GI-34992

Descriptors: *Photosynthesis, *Water, Enzymes, Hydrogen, Oxygen.
Identifiers: Biophotolysis, Hydrogenases.

Presented is a talk given on the aspects of biophotolysis of wate. Spinach chloroplasts and a bacterial hydrogenase were employed.

PB-228 760/5GA PC$4.00/MF$1.45
Case Western Reserve Univ., Cleveland, Ohio. Dept. of Microbiology.
HYDROGEN PRODUCTION BY PHOTOSYNTHESIS AND HYDROGENASE ACTIVITY--AN ENERGY SOURCE.
Summary progress rept. 1 Mar-1 Jul 73,
L. O. Krampitz. 24 Aug 73, 8p NSF-RA/N-73-017
Grant NSF-GI-34992

Descriptors: *Hydrogen, *Photosynthesis, *Photolysis, Water, Decomposition reactions, Photochemical reactions, Algae, Bacteria, Clostridium, Plants(Botany), Enzymes.
Identifiers: Anacystis nidulans, Clostridium kluyveri, *Hydrogenases.

The objectives of the research have been to find conditions by which the radiant energy of the sun captured by the photosynthetic apparatus of green plants, green algae, or blue-green algae coupled with the action of the enzyme hydrogenase present in a variety of bacterial species could bring about the biophotolysis of water to hydrogen and oxygen. The main thrust of the proposed research is to find a stable product which when reduced by the photosynthetic apparatus can serve as a source of electrons for the reduction of protons to hydrogen by the catalytic action of hydrogenase. The author's method of approach to the problem is discussed.

PB-228 783/7GA PC$3.25/MF$1.45
Columbia Univ., New York. Div. of Environmental Health Sciences.
THE USE OF PANELISTS AS SUBSTITUTES FOR TAXICAB DRIVERS IN CARBON MONOXIDE EXPOSURE.
Final rept.,
A. Walter Hoover, and Robert M. Albrecht. Jul 73, 35p CRC-APRAC-CAPM-8-68-3
Sponsored in part by Environmental Protection Agency, Washington, D.C.

Descriptors: *Carbon monoxide, *Blood gas analysis, Lung, Air entrainment, Urban areas, Oximetry, Sampling, Air pollution, Public health.
Identifiers: *Carbonylhemoglobin, Taxicab drivers, Passengers, *Air pollution effects(Humans), Cigarette smoking.

Analyses of breath and limited blood samples from 30 pairs of taxi drivers and panelists who drove in New York City traffic for eight hours on two consecutive days indicated that both panelists and drivers attained similar COHb (blood carboxyhemoglobin) levels. This was true for both smokers and non-smokers though smokers had significantly higher concentrations of COHb than non-smokers. There was no consistent difference between the first and second day of driving in the levels of alveolar carbon monoxide.

6B. Bioengineering

N74-14833/9GA PC$3.00/MF$1.45
Techtran Corp., Glen Burnie, Md.
MEASUREMENT OF THE STROKE VOLUME BY AN INTEGRAL RHEOGRAM OF THE HUMAN BODY.
M. I. Tishchenko. Jan 74, 16p NASA-TT-F-15268
Contract NASW-2485
Tran-Transl. Into English from Fiziol. Zh. Sssr (Moscow), V. 59, No. 8, Aug. 1973 p 1216-1224.

Descriptors: *Ballistocardiography, *Blood flow, *Heart minute volume, *Rheometers, Biometrics, Blood circulation, Human body, Pulse rate.

For abstract, see STAR 1206

N74-14847/9GA PC$7.00/MF$1.45
Nortrop Corp., Beverly Hills, Calif. Electronics Div.
SKYLAB SO71/SO72 CIRCADIAN PERIODICITY EXPERIMENT.
Final Report.
M. K. Fairchild, and R. A. Hartmann. Nov 73, 99p
NASA-CR-114706, NORT-73-320
Contract NAS2-6897

Descriptors: *Circadian rhythms, *Experimental design, *Hardware, *Skylab program, Apollo applications program, Exobiology, Performance tests, Quality control.

For abstract, see STAR 1206

N74-14957/6GA PC$3.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
ELECTRONICS IN SOVIET HEALTH RESORTS.
N. Konakh. Jan 74, 4p NASA-TT-F-15284
Contract NASW-2481
Tran-Transl. Into English from Med. Gazeta (Moscow), 7 Dec. 1973 p 4.

Descriptors: *Biotelemetry, *Health physics, *U.s.s.r., Bioinstrumentation, Computer techniques, Electrocardiography, Remote sensors.

For abstract, see STAR 1206

PB-229 350/4GA PC$4.75/MF$1.45
General Electric Co., Schenectady, N. Y. Research and Development Center.
DEVELOPMENT OF METHODS TO DETECT INCIPIENT FAILURE IN ARTIFICIAL HEART DEVICES.
Annual progress rept. 25 Jun 72-24 Sep 73,
Leslie D. Meyer, Norman R. Kuehar, Judy R. McCullough, and Paul M. Griffen. 24 Oct 73, 134p* SRD-73-138 NIH-69-2238-4
Contract PHS-69-2238
See also PB-210 664

Descriptors: *Mechanical hearts, *Acoustic signals, *Respiratory diseases, *Arteriosclerosis, Monitors, Diagnosis, Cardiovascular diseases, Mechanical organs, Performance evaluation, Failure, Acoustic detection.
Identifiers: *Cardiac assist devices.

Investigations were conducted in three areas. The first study explored the feasibility of using passive acoustic monitoring techniques to quantitatively diagnose arterial obstructions secondary to atherosclerosis. It was concluded that arterial sound, by itself, does not convey sufficient information to allow assessment of arterial restrictions. The second investigation aimed at determining the diagnostic significance of lung sounds. Analysis of significant amounts of clinical data indicated that the respiratory maladies of interest do produce repeatable acoustic discriminants that can be extracted by conventional signal processing techniques. The final area of study focused on the development of passive acoustic procedures for clinical monitoring of prosthetic heart valves. This technology is developed to a point where major clinical trials are indicated.

6C. Biology

AD-774 814/8GA PC$3.00/MF$1.45
Edgewood Arsenal Aberdeen Proving Ground Md
BIOCHEMICAL STUDY OF THE SECRETION OF ABSCISSION ENZYME AS RELATED TO LEAF ABSCISSION AND DEFOLIATION.
Technical rept. Aug 72-Jun 73,
L. E. Forrence, and G. R. Leather. Feb 74, 11p
Rept no. EC-TR-73057

Descriptors: *Enzymes, *Plants(Botany), *Defoliants, Ethylene, Chemical analysis, Molecular properties, Biochemistry, Colchicine, Growth(Physiology).
Identifiers: *Leaf abscission, Bean plants, Plant physiology, Copper chlorides, Abscisic acid, Cellulase.

Abscission of bean petiolar explants is effected by the production of cellulase in the cytoplasm and its secretion into the intercellular spaces of the abscission zone (exocellular cellulase). Attempts to increase the production and secretion of cellulase were made by injection bean petiolar explants with several different chemicals. Their effects on explant abscission were evaluated and compared with that caused by ethylene which has been previously found to enhance abscission, cellulase production, and cellulase secretion. Of 11 compounds studied, only abscisic acid showed a direct relationship between abscission and increased cellulase production. This growth regulator, however, had no effect on cellulase secretion. Copper chloride, an ionic substance, materially increased abscission but not cellulase production. (Author)

AD-775 037/5GA Not available NTIS
National Research Council of Canada Ottawa (Ontario) Div of Biological Sciences
QUALITATIVE ANALYSIS OF FISH SCALES BY POLARIZATION,
Robert H. Whitehead. Jan 74, 3p NRC-13725
Availability: Pub. in the Jnl. of the Biological Photographic Association, v42 n1 p14-16 Jan 74.

Descriptors: Fishes, Scale, Measurement, Polarization, Light, Photography, Canada.
Identifiers: *Fish scales.

The selective range of colors and background hues that was possible with this method provided a clarity of the annular growth in the scales not possible with a conventional system. Through color separation the structural detail was enhanced with sharper boundaries that aided significantly in obtaining the information required. Reference terminology of this optical modification covers birefringence, polarization, pseudocolor, nonrepresentational color and others. For qualitative investigation in the laboratory it is a useful technique in the repertoire of the technical photographer.

AD-775 102/7GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
FORUM OF USSR PARASITOLOGISTS,
I. G. Galuzo. 31 Jan 74, 14p Rept no. FTD-HT-23-526-74
Edited trans. of Akademiya Nauk Kazakhskoi SSR, Alma-Ata. Izvestiya. Seriya Biologicheskikh Nauk, n3 p83-87 Apr/May 70, by Charles T. Ostertag, Jr.

Descriptors: *Parasites, *USSR, *Veterinary medicine, Animals, Fishes, Conferences, Parasitic diseases, Translations.
Identifiers: Zoonoses, Animal diseases.

Reports at the plenary session discussed the following topics: The evolution and theory of development of the science of natural focalization; problems of exterminating of sources and combatting helminthiases of animals; parasite-host relationships; problems of classification of parasitic protozoa; immunity and allergy; dealing with parasitic arthropoda; and, diseases of terrestrial commercial animals. On this same theme reports were heard at the plenary session of the council for the section on natural focalization and at the section on ichthyoparasitology.

AD-775 269/4GA Not available NTIS
Memorial Univ of Newfoundland St John'S Dept of Biology
HISTOPATHOLOGY OF 'AEDES AEGYPTI' (DIPTERA: CULICIDAE) LARVAE PARASITIZED BY 'REESIMERMIS NIELSENI' (NEMATODA: MERMITHIDAE),
C. H. Bailey, and R. Gordon. 16 Apr 73, 7p
Availability: Pub. in Jnl. of Invertebrate Pathology, v22 n3 p435-441 Nov 73.

Descriptors: *Culicidae, *Nematoda, Larvae, Aedes, Host-parasites, Infections, Pathology, Histology.
Identifiers: Aedes aegypti, Reesimermis nielseni.

Histological observations were made of Aedes aegypti larvae parasitized for 2, 4, and 6 days by Reesimermis nielseni. Little difference was detected between the tissues of uninfected and nematode-parasitized larvae 4 days after infection, at which time most hosts were in the early fourth instar and their fat bodies were well developed containing abundant storage materials. Nematodes grew most rapidly between day 4 and day 6 of parasitism. The severity of the nematodes upon host tissues depended upon intensity of infection. Dry weight measurements of nematode and host supported histological observations that the nematode developed most rapdily 4-6 days post-infection, thus causing most serious effects upon the host at that time. (Modified author abstract)

AD-775 583/8GA PC$3.00/MF$1.45
Wisconsin Univ Madison Mathematics Research Center
THE SAMPLING THEORY OF SELECTIVELY NEUTRAL ALLELES: INFINITE ALLELES AND INFINITE SITES MODELS.
Technical summary rept.,
W. J. Ewens. Jan 74, 20p Rept no. MRC-TSR-1376
Contract DA-31-124-ARO(D)-462

Descriptors: *Genes, Population, Chromosomes, Genetics, Proteins, Statistical analysis, Statistical processes.
Identifiers: *Alleles, Mathematical genetics.

Most of the data currently available on genetic polymorphism arises from electrophoretic studies on enzymes. In principle, it is possible to obtain more detailed data by studying complete protein sequences. Measures are found for the increase in statistical efficiency attained in this new form of data. Statistical tests for both forms of data are obtained and compared. (Author)

BNWL-1790 PC$4.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
RAPTORIAL BIRDS OF THE U.S.A.E.C. HANFORD RESERVATION, SOUTH-CENTRAL WASHINGTON.
R. R. Olendorff. Oct 73, 48p
Contract AT(45-1)-1830

Descriptors: (*Hapo, *Birds), Environment, Terrestrial ecosystems.

For abstract, see NSA 29 05, number 10158.

CEA-CONF-2266 PC$3.00/MF$1.45
RADIOBIOLOGICAL AND STANDARD DATA FOR RADIOPROTECTION AND RADIOTHERAPY.
H. Jammet. 5p CONF-720981-3
In French. U.S. Sales Only.

Descriptors: Biological radiation effects, Radiation protection, Radiobiology, Radiotherapy, Research programs, Reviews.

For abstract, see NSA 29 05, number 10346.

CEA-CONF-2370 PC$3.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Grenoble, 38 (France).
MOBILITY OF MACROPHAGES AND ALVEOLAR DECONTAMINATION IN DIFFERENT KINDS OF ANIMALS.
D. Nolibe, H. Metivier, and R. Masse. 2p CONF-730570-2
In French. U.S. Sales Only.

Descriptors: (*Macrophages, *Genetic variability), Cats, Dogs, Guinea pigs, Lung clearance, Lungs, Monkeys, Physiology, Rats.

For abstract, see NSA 29 05, number 12440.

COM-74-10484/5GA PC$3.00/MF$1.45
Lamont-Doherty Geological Observatory, Palisades, N.Y.
ARTIFICAL UPWELLING (PIPELINE INSTALLATION).
Final technical letter rept. 1 Feb-21 Dec 71,

Oswald Roels. 12 Nov 73, 15p NOAA-74012305
Contract NOAA-1-35364, Grant NSF-GH-87

Descriptors: *Oysters, *Clams, *Underwater pipelines, *Upwelling, Galvanic corrosion, Galvanized materials, Fish nutrition, Deep water, Aquaculture, Steels, Polyethylene, Fish ponds, Zinc coatings, Corrosion resistance.
Identifiers: Sea Grant program, Crassostrea virginica, Mercenaria mercenaria, *Artificial upwelling.

A brief description is given of the design and installation of a new triple pipeline in St. Croix. This was done to bring up nutrients from a depth of 830 meters for use in the mariculture of oysters and clams. Information is given on methods used to limit galvanic corrosion of the deep-sea section of the pipeline used to create artificial upwelling. The galvanized steel assembly is protected with zinc anodes. (Author)

COM-74-10485/2GA Reprint
National Marine Fisheries Service, Beaufort, N.C. Atlantic Estuarine Fisheries Center.
THE RADIATION SENSITIVITIES OF THREE SPECIES OF FIDDLER CRABS ('UCA PUGILATOR', 'U. PUGNAX', AND 'U. MINAX'),
D. W. Engel. 1973, 5p NOAA-74012811
Pub. in Chesapeake Science, v14 n4 p289-291 1973.

Descriptors: *Crustacea, *Irradiation, Dose rate, Crabs, Survival, Shellfish, Radiation tolerance, Shrimps, Temperature, Salinity, Ecology, Physiology, Lethality.
Identifiers: Uca pugilator, Uca pugnax, Uca minax, Callinectes sapidus, Palaemonetes pugio, Fiddler crabs.

The radiation sensitivites of five estuarine decapod crustacea were compared: three species of fiddler crabs, Uca pugilator, U. pugnax, U. minax; the blue crab, Callinectes sapidus, and the grass shrimp, Palaemonetes pugio. Temperature and salinity (20C and 30 0/00) and radiation dose rate (310 rad/min) were the same for all species. The 40-day LD-50 values for the fiddler crabs (U. pugilator, 9,800 rad; U. pugnax, 16,500 rad; and U. minax, 13,500 rad) fell between those of the blue crab, 42,000 rad, and grass shrimp, 215 rad. Possible physiological and ecological explanations for the differences in sensitivity are discussed. (Author)

COM-74-10487/8GA Reprint
National Marine Fisheries Service, Beaufort, N.C. Atlantic Estuarine Fisheries Center.
IDENTITY AND REGULATION OF NUTRIENTS LIMITING PHYTOPLANKTON PRODUCTION IN THE SHALLOW ESTUARIES NEAR BEAUFORT, N.C.,
Gordon W. Thayer. 1 Aug 73, 20p NOAA-74012812
Pub. in Oecologia (Berlin), v14 p75-92 1974.

Descriptors: *Phytoplankton, *Estuaries, North Carolina, Primary biological productivity, Animal nutrition, Photosynthesis, Nitrogen, Phosphates, Carbon.
Identifiers: *Beaufort(North Carolina).

Inorganic nutrients limiting phytoplankton production in the shallow estuarine system near Beaufort, N.C., were identified by nutrient enrichment techniques. Nitrogen was the primary limiting nutrient; phosphorus also was limiting at times. Samples receiving a complete enrichment medium plus organic substrates poor or lacking in nitrogen and phosphorus showed no significant increase in relative photosynthesis over unenriched controls, even though there was a significant decrease in the nitrogen and phosphorus concentrations in the enriched samples. (Modified author abstract)

COM-74-10494/4GA Reprint
Washington Univ., Seattle. Coll. of Fisheries.
GENE DUPLICATION WITHIN THE FAMILY SALMONIDAE: DISOMIC INHERITANCE OF TWO LOCI REPORTED TO BE TETRASOMIC IN RAINBOW TROUT,
Frederick W. Allendorf, and Fred M. Utter. 22 Feb 73, 10p NOAA-74012809
Grant NOAA-NG-172
Prepared in cooperation with National Marine Fisheries Service, Seattle, Wash. Northwest Fisheries Center.
Pub. in Genetics, v74 p647-654 Aug 73.

Descriptors: *Trout, Genetics, Genes, Evolution(Development), Populations.
Identifiers: Salmo gairdneri, Rainbow trout, Dehydrogenase/isocitrate, Salmonidae, Sea Grant program.

Described are studies of the genetics of allelic variation for nicotinamide-adenine dinucleotide phosphate (NADP)-dependent isocitrate dehydrogenase (IDH) in rainbow trout (Salmogairdneri). Five populations of rainbow trout were studied to determine the phenotypic distribution of IDH; 453 progency from a number of controlled matings were examined to determine the nature of inheritance of these alleles. The variation was found to be the result of four alleles producing protein subunits of differing electophoretic mobilities. Progeny from crosses clearly demonstrated the presence of two disomic loci controlling the variation, rather than one tetrasomic locus as had been previously reported. These findings support the contention that the hypothesis of a tetraploid event in salmonid evolution should not be uncritically accepted. (Author)

COM-74-10497/7GA Reprint
Delaware Univ., Newark. Coll. of Marine Studies.
TIDAL STREAM DEVELOPMENT AND ITS EFFECT ON THE DISTRIBUTION OF THE AMERICAN OYSTER,
Richard Keck, Don Maurer, and Les Watling. 28 Feb 72, 13p DEL-SG-22-73 NOAA-74012507
Contract NOAA-2-35223
Sponsored in part by Delaware Department of Natural Resources and Environmental Control.
Pub. in Hydrobiologia, v42 n4 p369-379 1973.

Descriptors: *Tidewater, *Oysters, *Streams, Stream flow, Distribution(Property), Geomorphology, Stream erosion, Aquaculture, Mollusca, Shellfish, Invertebrates.
Identifiers: Stream morphology, *Crassostrea Virginica, Sea Grant program.

The distribution of the American oyster is dependent upon the morphological development of tidal streams. Dense populations are most often found associated with large meanders. The differential current velocities associated with meander formation result in areas of scour, which are beneficial to development of oyster beds; and areas of deposition, which are detrimental to survival of oysters. (Author)

COM-74-10498/5GA Reprint
Alabama Dept. of Conservation and Natural Resources, Montgomery. Marine Resources Div.
BRACKISH WATER CAGE CULTURE OF RAINBOW TROUT (SALMO GAIRDNERI), IN SOUTH ALABAMA,
Walter M. Tatum. 1973, 5p NOAA-74020106
Grant NMFS-2-86-R
Pub. in Transactions of the American Fisheries Society, v102 n4 p826-828 Oct 73.

Descriptors: *Trout, *Brackish water, *Aquaculture, Alabama, Commercial fishing, Acclimatization, Feasibility, Fish economics, Fish stocking.
Identifiers: *Salmo gairdneri.

Experiments in the brackish water culture of rainbow trout (Salmo gairdneri) were conducted from 25 November 1971 to 24 March 1972 to determine the feasibility of providing a supplemental cash crop in the coastal water of Alabama during the winter. During this period trout were raised from an initial weight of 93.8 g to 354.8 g when stocked at 196 fish/cu m and 322.3 g when stocked at 392 fish/cu m. Rainbow trout acclimated easily to brackish water and their potential to southern mariculture appears promising. (Author)

COM-74-10501/6GA Reprint
National Marine Fisheries Service, Milford, Conn. Middle Atlantic Coastal Fisheries Center.
CYTOGENETIC ANALYSIS OF AN ATTEMPTED INTER-SPECIES HYBRIDIZATION OF THE OYSTER,
S. S. Stiles. 3 Sep 73, 7p NOAA-74020113
Pub. in Incompatibility Newsletter, n3 p41-45 Sep 73.

Descriptors: *Oysters, *Hybridization, Aquaculture, Fisheries, Genetics, Larvae, Breeding, Reproduction(Biology).
Identifiers: Crassostrea angualata, Crassostrea virginica, *Cytogenetics.

An attempted inter-species hybridization of the oyster is reported. The cross was between the edible Portuguese oyster, Crassostrea angulata, and the commercial American species, Crassostrea virginica. Fertilization data are summarized. In spite of the very slight amount of normal activity at meiotic, fertilization, and cleaving stages, hybrid larvae developed and remained alive for 15 days. The larvae were, however, grossly abnormal when first examined at the 48-hour stage. Varying degrees of gamete incompatibility in individual oysters and populations undoubtedly can account for varying degrees of cross failure with certain limits. This is in addition to the numerous physiological variables that affect the success of fertilization. The inter-species gamete incompatability of the oyster may be related to sib incompatibility noted in the American oyster.

COM-74-10502/4GA Reprint
National Marine Fisheries Service, Galveston, Tex. Gulf Coastal Fisheries Center.
HOST RESPONSE IN THE WHITE SHRIMP, 'PENAEUS SETIFERUS', TO INFECTION BY THE LARVAL TRYPANORHYNCHID CESTODE, 'PROCHRISTIANELLA PENAEI',
Albert K. Sparks, and C. T. Fontaine. 19 Feb 73, 9p Contrib-357 NOAA-74020719
Pub. in Jnl. of Invertebrate Pathology, v22 n2 p213-219 Sep 73.

Descriptors: *Shrimps, *Helminthic diseases, *Parasitic diseases, Infectious diseases, Larvae, Response(Biology), Shellfish, Aquatic biology, Mexico Gulf, Pathology, Parasites, Cysts, Worms.
Identifiers: Penaeus setiferus, Cestoda, Host parasite relations, Prochristianella penaei.

White shrimp, Penaeus setiferus, infected by the plerocercoid larva of the trypanorhynchid cestode, Prochristianella penaei, respond to infections in the heptaopancreas by developing a progressively denser cyst, composed of hemocytes, fibroblasts, and collagenlike fibers, around the parasite. The pleocercoid is eventually destroyed and resorbed leaving a dense fibrous capsule in the hepatopancreas. Worms in the adjacent hemocoel are encapsulated by a thin host cyst and a less intense infiltration of cells and deposition of fibers, insufficient to destroy the plerocercoid. It is believed that the resorption process explains the drop in intensity of infection in juvenile white shrimp after a certain size is attained. (Author)

COM-74-10506/5GA Reprint
Rhode Island Univ., Kingston. Graduate School of Oceanography.
STUDIES ON THE DIGESTIVE LIPASE OF THE SURF CLAM 'SPISULA SOLIDISSIMA',
J. S. Patton, and J. G. Quinn. 12 Mar 73, 13p
Marine Reprint-5 NOAA-74012803
Contract NOAA-2-35190
Pub. in Marine Biology, v21 p59-69 1973.

Descriptors: *Clams, *Lipase, Enzymes, Pelecypoda, Mollusca, Biochemistry, Hydro lyases, Marine biology, Shellfish, Invertebrates, Lipids.
Identifiers: Spisula solidissima, Sea Grant program.

Crude molluscan lepase was prepared by homogenizing in tris buffer either fresh or lyophilized crystalline styles of Spisula solidissima. Both preparations showed specific activities less than 2% of standard hog pancreatic lipase, and pH and temperature optima of 8.0 and 20C, respectively. When compared with mammalian hog pancreatic lipase, the clam lipase was found to be the more versatile enzyme on primary wax esters as well as methyl esters. Neither lipase was capable of hydrolyzing the oelate or palmitate esters of the secondary alcohols of gycerol, cholesterol or isopropyl alcohol; however, both showed activity on the oleate ester of isobutyl alcohol, a primary alcohol. S. solidissima lipase, hog pancreatic lipase, and a lipase isolated from the pancrease of the skate Raja erinacea, all demonstrated in inability to hydrolyze the methyl esters of eicosatetraenoic, eicosapentaenoic and docosahexaenoic acids. (Modified author abstract)

COM-74-10526/3GA PC$3.00/MF$1.45
Rhode Island Univ., Kingston. Dept. of Fisheries and Marine Technology.
BOTTOM TRAWL MEASUREMENT TRAILS REPORT,
G. A. Motte, A. J. Hillier, and R. D. Beckwith.
1973, 12p Marine Bull-16 NOAA-74012801
Also pub. as Rhode Island Agricultural Experiment Station, Kingston. Contrib-1516.

Descriptors: *Fishing equipment, Narragansett Bay, Fishing, Commercial fishing, Fish harvesting, Test methods.
Identifiers: Sea Grant program.

Results of various Yankee 35 bottom trawl trails, which were conducted in Narragansett Bay by the University of Rhode Island (URI) research vessel, Gail Ann, are summarized. The trials were somewhat limited by vessel size, but produced information of interest to persons fishing from smaller inshore draggers.

COM-74-10527/1GA PC$3.00/MF$1.45
Rhode Island Univ., Kingston. Marine Advisory Service.
POTENTIAL UTILIZATION OF UNDEREXPLOITED SPECIES IN SOUTHERN NEW ENGLAND,
Andreas A. Holmsen. 1973, 9p Marine M-32 NOAA-74012802
Presented at the Atlantic Fisheries Technological Conference, Danvers, Mass., 15 Oct 73.

Descriptors: *Fisheries, *New England, Fishing, Shellfish, Fishes, Crabs, Squids, Clams, Fishing grounds, Utilization, Abundance, Commercial fishing.
Identifiers: Sea Grant program, Overfishing.

Due to heavy fishing pressure most, if not all, of the stocks of traditional species of fish and shellfish in southern New England waters are taxed fully, and many stocks. have been fished at levels beyond the maximum sustainable yield. Moreover, all of the major species of food fish are now under national or overall quotas--either annual quotas or quarterly ones--which seem to become smaller year be year. Latent resources in southern New England which offer some opportunities for development are the deep-sea red crab, the jonah crab, the monkfish, the skate, the ocean pout, the ocean quahog, the dogfish and the squid. Possibilities for exports or for domestic manufacturing of specialty items would include a long list of species from bluefin tuna to red hake and sea robbins.

COM-74-50187/5GA PC-GPO/MF$1.45-NTIS
National Marine Fisheries Service, Seattle, Wash.
SPORTMAN'S GUIDE TO HANDLING, SMOKING, AND PRESERVING COHO SALMON.
Fishery Facts,
Shearon Dudley, J. T. Graikoski, H. L. Seagran, and Paul M. Earl. Jun 73, 34p FSHFA-5 NOAA-74012808
Paper copy available from GPO $0.25 as C55.322:5.

Descriptors: *Salmon, *Food processing, Great Lakes, Quality, Fishing products, Seafood, Materials handling, Freezing, Food storage, Preserving, Smoking, New England Division.
Identifiers: Sport fishing, Coho salmon.

Since the coho is an introduced species and not a native to the Great Lakes and New England, guidelines are needed for handling, preserving, and effectively utilizing this fish. This brochure provides such guidelines for the sportsman so that he can have a high-quality product. The authors particularly emphasize the smoking process as one possible method of using the coho salmon effectively. They also include methods of preparing the fish for normal table use and for frozen storage for later use. Some general guidelines are briefly considered and then using these guidelines as a basis, some specific guidelines for handling coho are considered.

COM-74-50188/3GA PC-GPO/MF$1.45-NTIS
National Marine Fisheries Service, Seattle, Wash.
ALASKA'S FISHERY RESOURCES: THE DUNGENESS CRAB,
Fishery facts,
David T. Hoopes. Nov 73, 19p FSHFA-6 NOAA-74013109
Paper copy available from GPO $0.25 as C55.322:6.

Descriptors: *Crabs, *Fisheries, Shellfish, Reproduction(Biology), Growth, Arthropoda, Crustacea, Commercial fishing, Invertebrates, Fisheries research, Coasts, Alaska, United States, Management, Fish resources.
Identifiers: *Cancer magister.

Dungeness crabs, Cancer magister, occur in the inshore waters of the west coast of the United States and Alaska. Alaska production has averaged 9.2 million pounds annually since 1960; the yearly average value to the fishermen was between $1 and $2 million. A female may lay up to 1.5 million eggs, which adhere to small appendages under her abdomen until they hatch 7 to 10 mo later. The commercial fishery takes only male crabs, which are caught in baited pots. Crabs are either delivered to market alive or are cooked and prepared in several ways. In Alaska the State Department of Fish and Game is responsible for conducting research required for rational management and protection of this valuable shellfish resource. (Modified author abstract)

COM-74-50189-01 PC-GPO/MF$1.45-NTIS
National Marine Fisheries Service, Seattle, Wash.
MARINE FISHERIES REVIEW. VOLUME 36, NUMBER 1, JANUARY 1974.
Monthly rept.,
Thomas A. Manar. Jan 74, 57p NOAA-74013106
Paper copy available from GPO $12.50/year as C55.310:36, $1.25/copy as C55.310:36/1.

Descriptors: *Fisheries research, Marine fishes, Seafood, Freezing, Commercial fishing, Shrimp fisheries, Food processing, Squids, Distribution(Property), Crabs, Shellfish, Frozen foods, Abundance, Additives, Indonesia, Norfolk Canyon, Continental slopes, Reviews.

The issue contains the following articles: Home freezing of seafood; a vertical longline for Red Snapper fishing; aspects of the distribution and abundance of the Long-Finned Squid; solubilized fish muscle as a food binding material; a review of the Indonesian shrimp fishery and its present developments; and observations on distribution and abundance of Red Crabs in Norfolk Canyon and adjacent Continental Slope.

COM-74-50189-01-03
(Order as COM-74-50189-01)
National Marine Fisheries Service, Woods Hole, Mass. Northeast Fisheries Center.
ASPECTS OF THE DISTRIBUTION AND ABUNDANCE OF THE LONG-FINNED SQUID, 'LOLIGO PEALEI,' BETWEEN CAPE HATTERAS AND GEORGES BANK,
Fredric M. Serchuk, and Warren F. Rathjen. 1974, 9p MFR-Paper-1028 NOAA-74013106-3
Included in Marine Fisheries Review, v36 n1 p10-17 Jan 74, COM-74-50189-01.

Descriptors: *Squids, Mollusca, Invertebrates, Continental shelves, Seasonal variations, Bathymetry, Statistical data, Atlantic Ocean.
Identifiers: *Loligo pealei.

Variations in distribution and abundance of the long-finned squid, Loligo pealei, found between Cape Hatteras and Georges Bank were analyzed for the years 1967-1971. Spring catches of long-finned squid were greatest at depths from 111 to 183 m; in the fall the squid were most abundant at depths of from 27 to 110 m. A close relationship was found between the distribution of long-finned squid and bottom water temperature. (Modified author abstract)

COM-74-50189-01-05
(Order as COM-74-50189-01)
United Nations Development Program, Manila (Philippines).
A REVIEW OF THE INDONESIAN SHRIMP FISHERY AND ITS PRESENT DEVELOPMENTS.
Foreign fisheries leaflet,
M. Unar. 1974, 11p NMFS-FFL-73-16 NOAA-74013106-5, MFR-Paper-1030
Included in Marine Fisheries Review, v36 n1 p21-30 Jan 74, COM-74-50189-01.

Descriptors: *Shrimp fisheries, *Indonesia, Food supply, Food storage, Economic development, Fishing grounds, Fishing industry, Reviews.

In 1968 joint ventures involving foreign capital were established in shrimp fisheries in several parts of Indonesia, particularly in the Sumatra, Kalimanta, and West Irian regions. This has given rise to the establishment of new small shrimp centers such as those in Kotabaru, on the island of Pulau Laut in southeast Kalimantan, Ambon and Sorong.

COM-74-50189-01-06
(Order as COM-74-50189-01)
Virginia Inst. of Marine Science, Gloucester Point.
OBSERVATIONS ON DISTRIBUTION AND ABUNDANCE OF RED CRABS IN NORFOLK CANYON AND ADJACENT CONTINENTAL SLOPE,
Paul A. Haefner, Jr., and John A. Musick. 1974, 5p VIMS-Contrib-586 NOAA-74013106-6, MFR-Paper-1031
Grant NOAA-043-158-49, NSF-GA-37561
Included in Marine Fisheries Review, v36 n1 p31-34 Jan 74, COM-74-50189-01.

Descriptors: *Crabs, *Norfolk Canyon, *Continental Slopes, *Atlantic Ocean, Abundance, Distribution(Property), Crustacea.
Identifiers: *Geryon quinquedens, Sea Grant program.

The results of June, 1973 trawl and trap sets in the Norfolk Canyon and adjacent slope area are summarized with respect to red crab (Geryon quinquedens) distribution and abundance. Red crabs ranged in depth from 145 to 870 fathoms but were most abundant from 145 to 280 fathoms. (Modified author abstract)

JPRS-61252 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.

IDENTIFICATION OF VIRULENCE GENES IN AGENTS OF BROWN AND YELLOW WHEAT RUSTS,
G. A. Kraeva, L. K. Appilogova, V. V. Shopina, L. A. Mikhailova, and V. M. Berlyand-Kozhevnikov. 19 Feb 74, 12p
Trans. of Mikologiya i Fitopatologiya (USSR) n4 p312-317 1973.

Descriptors: *Rusts(Fungi), *Puccinia, *Genes, Chromosomes, Genetics, Plant pathology, USSR, Translations.
Identifiers: *Wheat rusts.

The report contains a method for differentiating the populations of yellow and brown rusts on monogenetic lines and allows a more accurate determination of the genetic basis of the pathogen's virulence.

LBL-1534 PC$4.50/MF$1.45
ORIGIN OF LIFE.
M. Calvin. 14 Aug 72, 50p CONF-720860-1
Contract W-7405-Eng-48

Descriptors: (*Animal cells, *Origin), (*Plant cells, Origin), Astronomy, Biological materials, Biological variability, Biology, Chemistry, Molecules.

For abstract, see NSA 29 05, number 12468.

PATENT-3 103 202 Not available NTIS
Department of the Interior, Washington, D.C.
METHOD OF TREATING OYSTER SHELLS AND OTHER COLLECTORS TO DIMINISH PREDATION.
Patent,
Victor L. Loosanoff, and Clyde L. MacKenzie, Jr. Filed 31 May 62, patented 10 Sep 63, 4p PAT-APPL-199 201, DOCKET/FWS-582
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Oysters, *Pest control, *Patents, Chlorobenzenes, Fouling, Effectiveness, Shellfish, Reproduction(Biology), Fouling organisms.
Identifiers: PAT-CL-119-4, Oyster cultch, Oyster Shells.

The invention is concerned with a method for increasing production of shellfish, particularly oysters. Oysters are the most important of the edible invertebrates and are currently gathered from oyster beds of the U.S. alone at an estimated rate of 26,000,000 bushels per year. It is the object of the invention to provide a chemical treatment of oyster cultch which will be effective in preventing fouling of the cultch with organisms other than oysters.

PATENT-3 128 744 Not available NTIS
Department of the Interior, Washington, D.C.
METHOD FOR INVESTIGATING THE MIGRATORY HABITS OF MACRO-ORGANISMS.
Patent,
Keith B. Jefferts, and Peter K. Bergman. Filed 2 Jan 63, patented 14 Apr 64, 4p PAT-APPL-249 103, DOCKET/FWS-615
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Fishes, Aminal migrations, Marking, Fishing grounds, Mortality, Boundaries.
Identifiers: PAT-CL-119-3, *Fish tagging.

The invention relates to a method and means having utility therein, for investigating the migration and related physiological characteristics of macro-organisms existing individually or in groups. More particularly, the invention concerns a procedure wherein fish are tagged internally with small particles carrying identification and information marks, and released in their normal environment, whereby a subsequent recovery of these fish with their tags, makes available data relevant to the aforementioned investigations.

PATENT-3 483 649 Not available NTIS
Department of the Interior, Washington, D.C.
ELECTRICAL TRAWL NET SYSTEM.
Patent,
Edward F. Klima, Wilber R. Seidel, William DeGrove, and Frank J. Hightower. Filed 29 Oct 68, patented 16 Dec 69, 6p PAT-APPL-771 582, DOCKET/FCF-1255
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Nets, *Fishing, *Patents, Electrodes, Pulse generators, Electric fields, Silicon controlled rectifiers.
Identifiers: PAT-CL-43-9, Electrical trawl net system.

The invention is an electrical system adapting a trawl net to function with an array of conducting wire electrodes which are attached to the footrope of the trawl net to place the electrodes ahead of, and transverse to the front opening of the net. The electrode array is activated by an electronic pulse generator whereby the array produces electric fields within the underwater bottom. A pulse forming circuit of the pulse generator operatively responds to a silicon controlled rectifier.

PB-228 660/7GA PC$5.75/MF$1.45
National Science Research Council of Guyana, Georgetown.
SOME PROSPECTS FOR AQUATIC WEED MANAGEMENT IN GUYANA.
17 Mar 73, 53p
Contract AID/csd-2584
Proceedings of Workshop on Aquatic Weed Management and Utilization Held in Georgetown (Guyana) 15-17 Mar 73. Prepared in cooperation with National Academy of Sciences, Washington, D.C.

Descriptors: *Aquatic weeds, *Guyana, Management, Utilization, Meetings, Aquatic biology, Weed control, Vegetation, Herbicides, Chemical properties, Feeding stuffs, Additives, Soils, Bibliographies.

The report is aof a three-day workshop on the management and utilization of aquatic plants, to formulate recommendations for implementation by local authorities to (1) deal with the aquatic weed problem, particularly by utilizing the vegetation as a resource for products, such as animal feeds and soil additives and (2) develop outlines of integrated systems of aquatic weed management in Guyana using biological, physical, and chemical methods. A bibliography is included.

6D. Bionics

AD-774 889/0GA PC$5.75/MF$1.45
Naval Undersea Center San Diego Calif
STUDY OF ANIMAL SIGNALS AND NEURAL PROCESSING, WITH APPLICATIONS TO ADVANCED SONAR SYSTEMS.
Final rept. Jan 72-Jul 73,
Richard A. Altes. Jan 74, 223p Rept no. NUC-TP-384

Descriptors: *Sonar signals, *Bionics, Animals, Broadband, Auditory signals, Signal processing.
Identifiers: *Animal communication.

Wideband signal theory is discussed in relation to presently used sonar signals. The advantages of broadband pulses for classification of non-planar targets is discussed, and a theory is presented which provides a simple, straightforward method of target classification. The use of such pulses for detection of targets in background clutter is described. Signals derived using this theory are essentially identical to those recorded from echolocating porpoises, indicating that the porpoise's sonar system may make use of similar signal design parameters. Bat echolocation signals are also derived. Application of the theory to auditory signal processing is discussed. (Author)

AD-775 439/3GA PC$19.00/MF$1.45
Massachusetts Inst of Tech Cambridge Artificial Intelligence Lab
PROGRESS IN VISION AND ROBOTICS,
Patrick H. Winston. May 73, 318p
Contract N00014-70-A-0362-0005

Descriptors: *Artificial intelligence, *Pattern recognition, *Robots, Learning machines, Semantics, Network flows, Vision, Computer programming, Mathematical logic, Graphics.

Contents: Summary of selected vision topics; Shedding light on shadows; A vision potpourri; Recognition of real objects; A heterarchical program for recognition of polyhedra; VISNEM: a bag of 'robotics' formulae.

N74-15134/1GA PC$3.25/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
A ROBOT ON THE LADDER OF EVOLUTION.
M. Vasin. Jan 74, 24p NASA-TT-F-15278
Contract NASW-2481
Tran-Transl. Into English from Nauka I Zhizn (Moscow), No. 11, Nov. 1973 p 16-25.

Descriptors: *Mechanical engineering, *Robots, *Servomechanisms, Aeronautical engineering, Lasers, Manipulators, Servocontrol, Walking.

For abstract, see STAR 1206

6E. Clinical Medicine

AD-774 770/2GA PC$5.00/MF$1.45
Scripps Clinic and Research Foundation La Jolla Calif
IMMUNOSPECIFIC ISOLATION AND CHARACTERIZATION OF TISSUE TRANSPLANTATION ANTIGENS.
Final technical rept. 1 Nov 70-31 Oct 73,
Walter B. Dandliker. 31 Jan 74, 162p
Contract N00014-71-C-0126

Descriptors: *Transplantation, *Antigens, *Immunology, Immunity, Neoplasms, Viruses, Medical research, Hamsters, Experimental data.
Identifiers: Simian virus 40.

The goal of the project is to elucidate and manipulate the immunological factors involved in the acceptance or rejection of transplants. The problem has been approached by studying the immune factors controlling the growth or rejection of syngeneic SV-40 virus induced tumors in hamsters. The authors have developed methods of measurement of the tumor associated antigens (TAA) and have utilized these assays in following the purification and isolation of TAA. The next phase of the program is to chemically and physically modify the purified TAA to produce immunogens which will more or less selectively raise either a humoral or cellular immune response. The effects of such immunizations will be related to the growth or rejection of transplants. (Author) Portions of this document are not fully legible.

AD-774 860/1GA PC$13.00/MF$1.45
Walter Reed Army Inst of Research Washington D C
RESEARCH IN BIOLOGICAL AND MEDICAL SCIENCES INCLUDING IN BIOCHEMISTRY, COMMUNICABLE DISEASE AND IMMUNOLOGY, INTERNAL MEDICINE, NUCLEAR MEDICINE, PHYSIOLOGY, PSYCHIATRY, SURGERY, AND VETERINARY MEDICINE. VOLUME I.
Annual progress rept. 1 Jul 72-30 Jun 73.
30 Jun 73, 717p
See also report dated 30 Jun 72, AD-758 134.

Descriptors: *Medical research, *Biomedicine, *Military medicine, Infectious diseases, Immunology, Surgery, Psychiatry, Biochemistry, Entomology, Pharmacology, Physiology, Radiobiology, Parasitic diseases, Malaria, Sensors, Bioinstrumentation, Preventive medicine, Tropical medicine, Drug abuse.

Contents:
In-house laboratory independent research;
Communicable diseases and immunology;
Research in biomedical sciences;
Basic research in support of military medicine;
Tropical medicine;
Ionizing radiation injury, prevention and treatment;
Malaria prophylaxis;
Biosensor systems;
Biomedical factors in drug abuse.

AD-774 896/5GA PC$3.00/MF$1.45
Office of Naval Research London (England)
INTERNATIONAL CONGRESS ON CLEFT PALATE (2ND), COPENHAGEN, DENMARK, 26-31 AUGUST 1973,
Peter W. Connole. 15 Nov 73, 24p Rept no. ONRL-C-22-73

Descriptors: *Infants, *Anomalies, Symposia, Reviews, Abstracts, Medical research, Denmark, Pathology, Therapy, Mortality rates, Genetics, Population.
Identifiers: *Cleft palate, *Congenital abnormalities, Anencephaly.

The report consists of summaries of papers given at the congress. The goal of the conference was to stimulate an exchange of views regarding the treatment of cleft lip and palate as well as craniofacial anomalies. Specifically long term results with established procedures and introduction of newer modifications were reported. Discussion centered around reconciliation of conflicting results with given procedures. (Author)

AD-774 938/5GA PC$3.25/MF$1.45
Harvard Medical School Boston Mass Dept of Surgery
BURN WOUND THERAPY.
Final rept. 1 Apr-31 Dec 73,
Donald P. Dressler, and George L. Blackburn. 1 Feb 74, 39p*
Contract N00014-67-A-0398-0035

Descriptors: *Burns(Injuries), Pathology, Therapy, Physiology, Surgery, Wounds and injuries, Microorganisms, Laboratory animals, Chemotherapy, Rats, Models, Histology, Experimental data.
Identifiers: Pseudomonas aeruginosa, *Liquid nitrogen, Thermal burns, Burn prophylactics and therapeutics.

There is no demonstrable advantage in the burn rat model to therapy consisting of a single application of liquid nitrogen to the burn wound. No significant alteration in the results was found in both the seeded and non-seeded burn controls in the mortality, eschar separation, insensible water loss, bacteriologic, histologic and biochemical studies. It was concluded therefore, that although the single application of liquid nitrogen may possibly be of some help in the clinical situation, on the basis of these laboratory studies and our clinical experience, the authors believe that the increased risk of sepsis and the possibility of further epidermal damage, particularly in the deep second degree injury, would outweigh any advantage. (Modified author abstract)

AD-774 908/7GA Reprint
Brooke Army Medical Center Fort Sam Houston Tex Army Inst of Surgical Research
OPEN AND CLOSED TREATMENT OF BURNS WITH POVIDONE-IODINE,
Nicholas G. Georgiade, and William A. Harris. 1974, 4p
Availability: Pub. in Plastic and Reconstructive Surgery, v53 n1 p82-83 1974.

Descriptors: *Burns(Injuries), *Iodine, Therapy, Bacteria, Cultures(Biology), Candida, Chemotherapy, Ointments, Infections, Fungi.
Identifiers: *Burn prophylactics and therapeutics, Poly(ethylene/oxo-pyrrolidenyl).

The study of burn treatment with povidone-iodine suggests that control of bacteria in the burn wound improved with greater frequency of Betadine ointment application. No significant difference was apparent between the open and closed treatment in patients treated with this agent. The absence of Candida organisms on the wounds of those patients treated with application of povidone-iodine ointment four times a day is particularly intriguing, and it is of potential clinical significance--in view of the increased incidence of candidal colonization and infection recently noted in burned patients.

AD-774 981/5GA Reprint
Brooke Army Medical Center Fort Sam Houston Tex Army Inst of Surgical Research
ESSENTIAL FATTY ACID DEFICIENCY IN RED CELLS AFTER THERMAL INJURY: CORRECTION WITH INTRAVENOUS FAT THERAPY,
George M. Helmkemp, Jr., Douglas W. Wilmore, Avery A. Johnson, and Basil A. Pruitt, Jr. 1973, 10p
Availability: Pub. in American Jnl. of Clinical Nutrition, v26 p1331-1338 Dec 73.

Descriptors: *Burns(Injuries), *Fatty acids, *Nutrition, Therapy, Blood chemistry, Erythrocytes, Stress(Physiology), Humans, Phospholipids, Cytology, Parenteral infusions.
Identifiers: Thermal burns.

Significant reduction in the levels of linoleate, arachidonate, and docosahexaenoate in red cell membrane phospholipid has been described in five severely burned humans. With these decreases in essential polyunsaturated fatty acids there were concomitant increases in palmitate, oleate, and the 24-carbon species. Infusion of a soybean lipid emulsion corrected the imbalance of red cell lipid components in two patients, whereas a fat-free intravenous diet that provided comparable calories failed to restore to normal the altered fatty acid pattern of a third individual. With restoration of normal fatty acid patterns, the abnormally low membrane lipid phosphorus levels and altered distribution of phospholipids also returned to within normal limits. The infusion of fat emulsion was without major consequence to the fatty acid composition of various plasma lipids. (Modified author abstract)

AD-775 124/1GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
PROBLEM ON THE STATE OF THE BRONCHOPULMONARY SYSTEM IN PATIENTS WITH CHRONIC ALLERGIC RHINOSINUSOPATHY,
I. I. Goldman, and S. I. Ovcharenko. 1 Feb 74, 12p Rept no. FTD-HT-23-575-74
Edited trans. of Vestnik Oto-Rino-Laringologii (USSR) v32 n4 p45-49 Jul/Aug 70, by Victor Mesenzeff.

Descriptors: *Otorhinolaryngology, *Allergic diseases, *Respiratory diseases, Lung, Respiratory system, Paranasal sinuses, Diagnosis(Medicine), USSR, Translations.
Identifiers: Asthma, Bronchitis.

By means of meticulous evaluation of the pulmonary anamnesis, auscultation of the lungs, spirography, pneumotachometry and histamine aerosol provocations the authors examined the lower respiratory tract in 57 patients with chronic allergic rhinosinusopathy. According to the accepted classification a catarrhal stage of rhinosinusopathy was noted in 14, edematous--in 6 hyperplastic--in 12 and polypous--in 25 patients. Latent bronchospasm was revealed in 28 patients, of this number allergic bronchitis with minimal clinical manifestations in 10, with clinically marked symptoms in 9; bronchial asthma was established in 8 patients. The lungs proved to be healthy only in 2 patients with a short-term allergological anamnesis. In the overwhelming majority of cases bronchial, asthma was found in persons with a protracted allergological anamnesis suffering from persistent, often irreversible, changes of the mucous membrane of the nose and accessory sinuses (hyperplasia, polyposis).

AD-775 125/8GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
CYTOPLASMATIC ALKALINE PHOSPHATASE AND ALLERGIC ALTERATION OF BLOOD LEUKOCYTES AFTER SENSITIZATION DURING SONNE KERATOCONJUNCTIVITIS IN ANIMALS AND DURING DYSENTERY IN HUMANS,
D. M. Nedopryadko, and G. I. Fredman. 1 Feb 74, 15p Rept no. FTD-HT-23-405-74
Edited trans. of Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (USSR) n3 p78-83 1971, by Dean F. W. Koolbeck.

Descriptors: *Allergic diseases, *Infectious diseases, *Leukocytes, Blood cells, Dysentery, Phosphatases, Enzymes, Antigens, Diagnosis(Medicine), USSR, Translations.
Identifiers: Keratoconjunctivitis, Conjunctivitis.

Working on the basis of the pathogenetic significance of bacterial sensitization during dysenteric infection, the authors investigated allergic alterations of leukocytes. They determined the nature of changes and distribution of the activity of cytoplasmatic alkaline phosphatase in the process of allergic alteration of the leukocytes of the blood during Sonne dysenteric keratoconjunctivitis in guinea pigs. They also compared the content and activity of the enzyme in healthy humans, patients with dysentery, and persons excreting bacteria during epidemiological examinations at sites of intestinal infections. A summary of the results is reported.

AD-775 204/1GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
IN SEARCH OF ALLERGENS,
V. Glazkova. 22 Feb 74, 7p Rept no. FTD-HT-23-713-74
Edited trans. of Sovetskaya Estoniya (USSR) n213 p4, 11 Sep 73, by Ray E. Zarza.

Descriptors: *Allergic diseases, Etiology, Antigens, Diagnosis(Medicine), Occupational diseases, Therapy, USSR, Translations.
Identifiers: *Allergens, Skin tests.

An allergy is an affliction that causes great physical and moral discomfort to man. It manifests itself in many ways. To recognize the intrinsic cause of an allergy is not easy. Allergic skin tests utilizing occupational and domestic allergens, make it possible to detect the source of the allergy. The prescription for the cure is simple, complete exclusion of all contact with the allergen, and then the affliction disappears just as suddenly as it broke out.

AD-775 227/2GA PC$3.25/MF$1.45
Office of Naval Research London (England)
BRITISH MEDICAL RESEARCH COUNCIL'S REPORT 1972-1973,
Arthur W. Frisch. 28 Nov 73, 33p Rept no. ONRL-R-28-73

Descriptors: *Great Britain, *Medical research, State of the art, Finance.
Identifiers: Grants.

The report provides an overview of some of the ongoing investigative activities in the United Kingdom. The total expenditure of Medical Research Council for 1971-72 was roughly 62.5 million dollars; this amount was increased to around 71 million during 1972-73. About half of the support was given in 5 of 16 disease categories which include infective and parasitic diseases (25), neoplasms (21), endocrine, nutritional and metabolic (18), mental disorders (21) and diseases of the nervous system and sense organs (24).

AD-775 239/7GA PC$3.00/MF$1.45
American Dental Association Chicago Ill*
SOME BIOPHYSICAL AND MICROCHEMICAL PROPERTIES OF ORAL STRUCTURES IN HEALTH AND DISEASE.
Annual rept. no. 3, 1 Jan-31 Dec 73,
H. W. Lyon, J. J. Hefferren, W. R. Cotton, and J. Oldershaw. 31 Dec 73, 23p
Contract N00014-71-C-0134
See also AD-759 034.

Descriptors: *Dental caries, *Oral diseases, *Gingivitis, *Streptococcus, Bacteria, Teeth, Biophysics, Tissues(Biology), Pathology, Histology, Electron microscopy.
Identifiers: *Preventive dentistry, Dental enamel, Streptococcus mutans, Dental calculi.

The study seeks answer to new questions concerning the preventive aspects of dental caries and periodontal disease by use of clinical and biophysical procedures. Specific objectives were as follows: Determine the role of Streptoccus mutans in the subclinical stage of carious lesions; determine any distinguishing morphological characteristics of S. mutans in order to identify its variants, S. sanguis, S. salivarius and S. fecalis; determine morphological and chemical properties of caries susceptible areas in tooth structure; and study the periodontal characteristics of the calculus-tooth structure interface and the adjacent gingival tissues.

AD-775 266/0GA Reprint
Navy Medical Neuropsychiatric Research Unit San Diego Calif
ORGANIZATIONAL FACTORS AND HEALTH STATUS,
Blair W. McDonald, W. M. Pugh, and E. K. Eric Gunderson. 1973, 9p Rept no. NMNRU-73-34
Availability: Pub. in Jnl. of Health and Social Behavior, v14 p330-334 Dec 73.

Descriptors: *Morbidity, *Health, *Social psychology, Military organizations, Naval personnel, Shipboard, Epidemiology, Environments.

From data gathered on 4,586 enlisted crew members aboard six combat ships, the hypothesis that a significant increase in prediction of illness would result by taking organization or ship into account was confirmed. The results indicated not only that organizational variance was a significant component in the prediction of individual and group illness rates, but, taken by itself, the ship to which the individual was assigned was the single most effective predictor of individual illness rates. Further research is needed to determine the particular organizational characteristics that are responsible for this variance in illness rate, but it is clear that predictions of individual illnesses can be improved by giving attention to the organizational contexts in which these occur. (Author)

AD-775 307/2GA PC$3.00/MF$1.45
Children'S Hospital Medical Center Boston Mass Dept of Neurology
MULTIPLE SCHLEROSIS: A NEW HYPOTHESIS,
Hubert S. Mickel. 8 May 74, 16p
Contract N00014-72-C-0059

Descriptors: *Nervous system diseases, Paralysis, Etiology, Pathology, Blood platelets, Lipids, Oxidation, Fatty acids, Virus diseases, Autoimmunization, Immunology, Gastrointestinal diseases.
Identifiers: *Multiple sclerosis, Arachidonic acid.

As a result of enteric infection, peroxidized arachidonic acid and other fatty acids might be absorbed from the intestine, where there is customarily little absorption. Absorbed peroxidized arachidonic acid adsorbed onto to platelet surfaces would be transported throughout the body. The effect of peroxidized arachidonic acid on human platelets has been demonstrated as a potent aggregating agent. In the post-capillary venule in white matter, as well as elsewhere, platelets would aggregate and allow the passage of lipid peroxide to the surrounding white matter. Attack of the lipid peroxide on sulfhydryl groups would result in denaturation of proteins and provide an antigen for the production of an autoimmune response. (Author)

AD-775 339/5GA Not available NTIS
Defence and Civil Inst of Environmental Medicine Downsview (Ontario)
GENETIC CONTROL OF THE TENDENCY TO TOLERANCE CIRCUMVENTION,
J. E. M. St. Rose, and B. Cinader. 25 Apr 73, 7p
Rept no. DCIEM-RP-906
Prepared in cooperation with Toronto Univ. (Ontario). Inst. of Immunology. Revision of report dated 15 Jan 73.
Availability: Pub. in European Jnl. of Immunology, v3 n7 p409-415 1973.

Descriptors: *Immunology, *Genetics, Antigen antibody reactions, Rabbits, Experimental data, Canada.
Identifiers: Immune tolerance.

Random bred rabbits were injected with human serum albumin (HA) at birth to induce tolerance to HA. Tolerant animals were then immunized with a p-azobenzenesulfonic acid derivative of human albumin (HA-D31). A proportion of these animals, 42%, (27/64) responded with the production of antibody to HA-D31 (TCR-responders). Matings were carried out between TCR-responders and between TCR-nonresponders, and the offspring were subjected to the same procedures as their parents. Selective breeding of TCR-responders produced 70% (12/17) responders after two generations. Selective breeding of TCR-nonresponders produced only TCR-nonresponders after the third generation. Fourth generation offspring of TCR-nonresponders, which were not injected with HA at birth, produced an antibody response to HA-D31. The genetic control of responsiveness to HA-D31 in HA-tolerant rabbits is polygenic and autosomal. (Modified author abstract)

BNL-18379 PC$3.25/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
CARRIER-FREE EXP 11 C-LABELED CATECHOLAMINES IN NUCLEAR MEDICINE AND BIOCHEMICAL RESEARCH.
J. S. Fowler, A. P. Wolf, D. R. Christman, R. R. MacGregor, and A. Ansari. 1973, 23p CONF-740203-2

Descriptors: (*Adrenal glands, *Radioisotope scanning), (*Myocardium, Radioisotope scanning), (*Carbon 11, *Tracer techniques), Adrenaline, Diagnostic techniques, Dogs, Dopamine, Heart, Labelled compounds, Noradrenaline, Nuclear medicine, Patients, Radiochemistry, Radionuclide administration, Radionuclide kinetics, Testing.

For abstract, see NSA 29 05, number 10500.

CEA-CONF-2184 PC$3.00/MF$1.45
ACTUAL SITUATION AND DEVELOPMENT OF THE USE OF RADIOELEMENTS IN MEDICAL DIAGNOSIS.
R. Sauvagnac, and R. Henry. 9p CONF-720567-2
In French. U.S. Sales Only.

Descriptors: (*Nuclear medicine, *Reviews), (*Technetium 99, *Isotope production), (*Indium 113, Isotope production), (*Cesium 131, Isotope production), Chemical preparation, Diagnostic techniques, France, Isomeric nuclei, Japan, Medical personnel, Mercury 197, Radiation doses, Radiation protection, Radioisotope generators, Radioisotopes, Radionuclide administration, Radiopharmaceuticals, Tracer techniques, Usa.

For abstract, see NSA 29 05, number 10501.

COM-74-50129/7GA Not available NTIS
National Bureau of Standards, Washington, D.C.
REACTION OF DICALCIUM PHOSPHATE DIHYDRATE WITH FLUORIDE.
Final rept.,
L. C. Chow, and W. E. Brown. 1973, 8p
Pub. in Jnl. of Dental Research, v52 n6 p1220-1227 Nov/Dec 73.

Descriptors: *Calcium phosphates, *Teeth, *Fluorination, *Dental caries, Fluorides.
Identifiers: Fluorapatites, Tooth enamel.

The intermediate formation of CaHPO4:2H2O and its subsequent conversion to Ca5(PO4)3F or CaF2 may be a major factor in increased fluoride uptake when tooth enamel is pretreated with acid solutions before being exposed to fluoride. To obtain information concerning the form of fluoride incorporation, the reactions of CaHPO4:2H2O with solutions containing various amounts of F(-) and PO4(3-) ions were studied.

JPRS-61143 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
EPIDEMIOLOGIC CHARACTERISTICS OF MORBIDITY IN THE USSR POPULATION,
B. L. Cherkasskii. 5 Feb 74, 11p
Trans. of Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (USSR) n8 p3-9 1973.

Descriptors: *Zoonoses, *Infectious diseases, *Public health, USSR, Translations, Epidemiology, Animal diseases, Livestock, Morbidity, Populations.

The report contains data to show that zoonotic infections primarily strike individuals engaged in physical work at agricultural enterprises or in regions which are natural foci for the infections.

PB-228 445/3GA PC$3.75/MF$1.45
California Univ., Berkeley.
SHEAR-INDUCED HEMOLYSIS: MATERIALS, AND BLOOD COMPOSITION.
Annual rept. 1 Nov 72-31 Oct 73,
Michael C. Williams. 1 Nov 73, 67p NIH/NHLI-NO1-HL3-2952-1
Contract NO1-HL-3-2952

Descriptors: *Hemolysis, *Shear stress, Blood, Erythrocytes, Hemoglobins, Blood proteins, Fragility, Mechanical properties.
Identifiers: *Biomechanics, Blood compatible materials, Biomaterials.

Blood and erythrocyte suspensions in various protein solutions were sheared between rotating discs for 10,000 sec, with the released hemoglobin in the fluid being analyzed at intervals. Shear stresses were of order 100 dynes/sq m at r = R (disc edge). After considerable attention to alignment, edge effects, and sampling, data scatter was minimized and reproducible 'kinetic hemolysis curves' (KHC) showing cHb(t) were obtained. The KHC is sensitive to the character of materials it contacts, and efforts were made to acqire special biomedical materials for disc fabrication for subsequent testing. Using common metal and plastic discs, KHC's were found also to vary when discs were precoated with protein and when the RBC medium contained proteins. A plasms medium reduced hemolysis relative to pure saline suspensions, and was similar to gamma-globulin solutions

in this respect. Fibrinogen and albumin solutions were less good.

PB-228 567-T/GA PC$4.00/MF$1.45
National Institutes of Health, Bethesda, Md. Translation Unit.
HISTOLOGICAL CLASSIFICATIONS OF BREAST CANCER,
D. I. Golovin. Feb 74, 8p NIH-74-140C
Trans. of Voprosy Onkologii (USSR) v18 n10 p15-19 1973.

Descriptors: *Breast carcinoma, *Malignant neoplasms, Classifications, Growth, Cells(Biology), Oncology, Histology, USSR, Translations.

The principles of some modern classification systems for breast neoplasms based on cell growth rather than on a formal descriptive listing of them as seen in classical oncology are discussed. Particular note is made of the merits and disadvantages of the systems of R.W. Willis and F.W. Stewart, whose classification has been presented with modifications in the first Soviet manual on diagnosis of tumors, 1968. A variant classification system is suggested taken from Stewart and R.W. Scarff and H.T. Torloni, whose international classification classification was compiled in 1968. The author notes that the development of a rational histological classification system is still in progress.

PB-228 568-T/GA PC$4.00/MF$1.45
National Institutes of Health, Bethesda, Md. Translation Unit.
POSSIBILITIES OF COMBINED AND COMPLEX TREATMENT OF DIFFUSE AND INFILTRATIVE FORMS OF BREAST CANCER,
A. V. Sanchankova. Jan 74, 9p NIH-74-234C
Trans. of Voprosy Onkologii (USSR) v18 n4 p6-10 1972.

Descriptors: *Breast carcinoma, *Malignant neoplasms, Hormones, Drug therapy, Mastectomy, X ray irradiation, Radiotherapy, USSR, Translations.
Identifiers: Metastases(Pathology), *Cancer.

Modern treatment for the diffuse-infiltative forms of breast cancer should involve a complex therapeutic approach involving x-ray irradiation and surgical removal of the primary tumor in combination with hormone and drug therapy. Drug therapy is the most promising component of complex therapy in reducing the percentage of remote metastases in highly malignant forms of breast cancer. A reduced ability to react to hormone therapy is noted in patients with the diffuse-infiltrative forms of breast cancer; this phenomenon is due to an inherent hormonal characteristic of this form of breast cancer. In the clinical data presented 65% of patients survived three years and 38.3% survived five years or more. The stage of the disease, the clinical form of the neoplasm as well as the methods of treatment used should be studied for evaluation of the remote results of breast cancer therapy.

PB-228 664/9GA PC-GPO/MF$1.45-NTIS
Bureau of Radiological Health, Rockville, Md.
SCIENTIFIC SEMINARS OF NUCLEAR MEDICINE LABORATORY DEDICATION.
Technical rept.,
Richard Van Tuinen, and Kenneth L. Scholz. Nov 73, 55p DHEW/FDA-74-8012
Paper copy available from GPO $0.95 as stock no. 1715-00064.

Descriptors: *Health physics, *Radiobiology, X rays, Dosimetry, Radiation dosage, Biochemistry, Meetings, Pharmacology, Clinical medicine, Radioactive isotopes.
Identifiers: *Nuclear medicine, *Radiopharmaceutical agents.

The publication contains the proceedings of two seminars held in conjunction with dedication ceremonies of the Bureau of Radiological Health's Nuclear Medicine Laboratory, Cincinnati, Ohio. The need for production of organ-specific radiopharmaceuticals of low-radiation dose was reviewed in the first seminar. A second seminar provided an overview of present techniques and innovations in the efficacious practice of clinical nuclear medicine. A significant increase in consumer protection activities by support of surveillanceand compliance programs and by improving the scientific base that unites regulatory activities would be undertaken in the Food and Drug Administration. Participation and cooperation of medical, scientific, and academic communities as well as industry are vital and necessary.

PB-229 406/4GA PC$3.75/MF$1.45
California Univ., San Francisco. Dept. of Clinical Pathology and Lab. Medicine.
BIOIMMUNOLOGY OF HBAG CARRIERS.
Annual rept. Jun 72-Jul 73,
Girish N. Vyas. 20 Sep 73, 55p
Contract PHS-72-2958-B

Descriptors: *Immunology, *Hepatitis, Hepatitis viruses, Disease vectors, Antigens, Lymphocytes, Cells(Biology), Immunity, Viral diseases, Experimental data, Laboratory animals, Humans.
Identifiers: Interferon.

An understanding of the cellular and humoral immunity to Hepatitis B antigen (HBAg) could elucidate the mechanisms underlying the HBAg chronic carrier state and conceive of the means for its termination. Prior to study in man, experimental work was carried out in guinea pigs and chimpanzees. A total of 20 patients, 20 asymptomatic healthy carriers of hepatitis B antigen and 20 controls demonstrated no gross immunologic deficiency. However, in sequential study of five patients it was found that leukocyte migration inhibition (LMI) in the presence of HBAg is transiently observed for a period of 3-4 weeks when the antigen is eliminated from circulation. Experimental correlation of LMI and skin reaction to HBAg in chimpanzees was accomplished prior to evaluation of LMI in man. The cumulative knowledge indicates that HBAg is eliminated by cell mediated immunity, that HBAg chronic carrier state is tolerogenic state and that a careful study of the mediators of immune response will be useful.

PB-229 447/8GA PC$8.50/MF$1.45
University of Southern California, Los Angeles. Human Resources Research Center.
THE PRELIMINARY OPERATIONAL HUMAN RESOURCES RESEARCH CENTER MICROSIMULATION MODEL.
Final rept.,
Donald E. Yett, Leonard Drabek, Michael D. Intriligator, and Larry J. Kimbell. 1973, 402p*
Contract PHS-71-4065

Descriptors: *Medical services, *Medical personnel, Hospitals, Manpower, Requirements, Economic analysis, Statistical analysis, Models, Simulation.
Identifiers: Health care delivery systems.

The research is part of a larger effort to combine economic analysis, statistical estimation, and simulation techniques to develop a microsimulation model of the entire health care system. It includes a literature survey of research on models; the development of a preliminary operational model; the acquisition of appropriate data and development of computer programs to estimate the functional relationships of the model; the preparation of a computer program for simulating the model; the design of policy simulations to be performed by the estimated model; and the testing of the model against historical data. The extent to which the model deals with locational factors is also described. Conclusions include recommendations for further research on the implementation and utilization of the model.

PB-229 484/1GA PC$4.00/MF$1.45
Boston City Hospital, Mass. Channing Lab.
CASE CONTROL STUDIES ON HOST FACTORS AS DETERMINANTS OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD) SUSCEPTIBILITY.
Annual rept., Jul 72-1973,
Ira Tager, and Edward H. Kass. 1 Oct 73, 92p
NO1-HR2-2944-A73
Contract NO1-HR-2-2944

Descriptors: *Respiratory diseases, *Bronchitis, Diagnosis, Epidemiology, Genetics, Immunology, Etiology, Bacteria, Environments.
Identifiers: *Chronic obstructive lung disease.

A case control study is presented which attempts by household survey to determine whether there is familial aggregation amongst blood relatives of chronic bronchitis and pulmonary function abnormalities, and environmental, immunologic and genetic factors may account for such aggregation. Discussion of a new portable spirometer is presented. Preliminary data is presented on problems associated with the closing volume determination, and the prevalence of bacterial species in the study population of bronchitis.

PB-229 565/7GA PC$4.00/MF$1.45
Boston City Hospital, Mass. Channing Lab.
POPULATION STUDIES ON RESPIRATORY DISEASES.
Annual rept. Sep 72-Sep 73,
Ira Tager, and Edward Kass. 1 Oct 73, 82p N01-HR3-2906-A73
Contract N01-HR-3-2906

Descriptors: *Respiratory diseases, *Bronchitis, Bacterial diseases, Epidemiology, Genetics, Immunology, Etiology, Urban areas, Environments.
Identifiers: *Chronic obstructive lung disease.

A random sample of a well-defined urban community is being studied by household survey to answer the following: What is the prevalence of chronic obstructive pulmonary disease (COPD) in this community. Is there household aggregation of COPD, and what are the environmental, socioeconomic and bacterial correlates of this agregation. Discussion of a new portable spirometer is presented and preliminary data is presented on problems associated with the closing volume determination and the prevalence of bacterial species in the study population of bronchitics.

TID-3319-S5 PC$10.60/MF$1.45
Usaec Technical Information Center, Oak Ridge, Tenn.
NUCLEAR MEDICINE. BIBLIOGRAPHY FROM NUCLEAR SCIENCE ABSTRACTS, VOLUMES 26 AND 27.
Dec 73, 406p

Descriptors: (*Nuclear medicine, *Bibliographies), Diagnostic techniques, Patients, Radioisotope scanners, Radioisotope scanning, Radionuclide administration, Scintiscanning, Tracer techniques.

For abstract, see NSA 29 05, number 10504.

6F. Environmental Biology

AD-774 973/2GA Reprint
Woods Hole Oceanographic Institution Mass
ENERGY TRANSFORMATIONS BY THE SARGASSUM FISH, HISTRIO HISTRIO (L).
Technical rept.,
K. L. Smith, Jr. 1973, 13p Rept nos. WHOI-73-86, WHOI-Conbrib-3024
Contract N00014-66-C-0241, Grant NSF-GZ-1508
Sponsored in part by grant NSF-GA-28365.
Availability: Pub. in Jnl. Exp. Mar. Biol. Ecol., v12 p219-227 1973.

Descriptors: *Fishes, *Metabolism, *Ecology, Food, Marine biology.

Identifiers: Histrio histrio, Sargassum fish, Feeding habits.

Ingestion, egestion, growth, and respiration measurements were made in the laboratory on three size-classes of the Sargassum fish, Histrio histrio (L.). Comparison of three size-classes showed changes from high growth and low respiration and assimilation in small Histrio to reduced growth and increased respiration and assimilation in larger fish. A high assimilation and growth efficiency suggest that Histrio is adapted to a food-limited environment (Sargasso Sea). Energy requirements of the smallest size-class (10-29 mm) were compared to the energy provided by their dominant food source, the Sargassum shrimp Latreutes fucorum (Fabricius) and Leander tenuicornis (Say). The annual energy requirement per individual was 1.4 times greater than the food energy available. This discrepancy is attributed to the difficulty in extrapolating laboratory studies to the field and the difficulty in obtaining adequate population size measurements of the Sargassum community fauna. (Author)

AD-775 408/8GA PC$5.00/MF$1.45
Army Engineer Waterways Experiment Station Vicksburg Miss
AQUATIC PLANT CONTROL PROGRAM. TECHNICAL REPORT 6. BIOLOGICAL CONTROL OF WATER HYACINTH WITH INSECT ENEMIES.
Final rept.,
Edward O. Gangstad, Julian J. Raynes, Charles F. Zeiger, Jean M. Ingersoll, and Robert D. Gordon. Jan 74, 156p*
See also report dated Oct 73, AD-769 583.

Descriptors: *Aquatic plants, *Beetles, Control, Ecology, Coleoptera, Insects.
Identifiers: Neochetina eichhorniae, *Biological weed control, *Weed control.

Present water hyacinth control programs provide at best only short-term control, and thus are of short-term benefit as far as productivity of the environment is concerned, whereas successful biological control will provide long-term benefits to productivity, with a concomitant reduction in the use of chemical or mechanical disturbances of the environment. Once a biological control agent is established, it becomes an integral part of the environment and as such may properly be considered a self-renewable resource, and a beneficial addition to our environment. It is a hope that Neochetina eichhorniae will prove to be just that, and that it will, alone or in conjunction with other native or introduced natural enemies, bring about the alleviation of the problems caused by water hyacinth in the southeastern United States. (Author)

AD-775 428/6GA PC$3.00/MF$1.45
Edgewood Arsenal Aberdeen Proving Ground Md
NONHERBICIDAL DEFOLIANTS. IV. ECOLOGICAL EFFECTS OF ENDOTHALL/ETHEPHON.
Technical rept. Jun 72-Feb 73,
Gerald R. Leather, and John P. Sterrett. Feb 74, 17p Rept no. EC-TR-73051
See also AD-770 367.

Descriptors: *Defoliants, *Ecology, Plants(Botany), Growth(Physiology), Inhibition.
Identifiers: Growth regulators, *Endothall, *Ethephon, Phosphonic acid/chloroethyl.

Some ecological effects from the use of the growth regulators, ethephon and endothall in combination, have been examined and found to be minimal. The ethylene evolution from 84 micromoles of ethephon in phosphate-buffered solution, pH 6.5, attained a maximum rate of about 950 microliter/liter per hour after one day. Ethephon was absorbed by the roots in nutrient solution causing a 50% growth inhibition at 0.5 to 1.0 mg/liter. However, untreated companion plants located adjacent to foliar-treated plants showed no epinasty, abscission, or growth inhibition over a seven-day period in soil or nutrient solution. Translocation of 14C-ethephon was evident throughout the plant four hours after foliar application. No exudation of radioactive material from the roots of foliarly treated plants was detected. Addition of endothall did not alter exudation of ethephon or ethylene evolution. Ecological effects involved with large-scale applications of endothall/ethephon are assessed by projection of the laboratory results. (Author)

COM-74-10499/3GA Reprint
Delaware Univ., Newark. Coll. of Marine Studies.
STUDIES ON THE OYSTER COMMUNITY IN DELAWARE: THE EFFECTS OF THE ESTUARINE ENVIRONMENT ON THE ASSOCIATED FAUNA,
Don Maurer, and Les Watling. Dec 73, 43p DEL-SG-20-73 NOAA-74012805
Grant NSF-GH-109
Pub. in Internationale Revue der gesamten Hydrobiologie v58 n2 p161-201 1973.

Descriptors: *Estuaries, *Oysters, *Delaware Bay, Animal ecology, Environments, Aquatic animals, Salinity, Aquatic biology, Substrates, Porifera, Coelenterata, Platyhelminthes, Annelida, Mollusca, Arthropoda.
Identifiers: Sea Grant program, Chordata.

The purpose of the study was to determine the composition of the associated fauna of Delaware's oyster beds. The relative position of Delaware's oyster producing tributaries lends itself to testing the classic hypothesis concerning the effect of salinity on faunal distribution. The hardy nature and geologic history of this oyster community makes it a likely candidate as a sensitive indicator of environmental degradation in the estuary. (Modified author abstract)

N74-14823/0GA PC$5.25/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
PROBLEMS OF SPACE BIOLOGY. VOLUME 20. MATHEMATICAL MODELS OF BIOLOGICAL SYSTEMS.
Y. M. Svirezhev, and Y. Y. Yelizarov. Nov 73, 185p NASA-TT-F-780
Contract NASW-2481
Tran-Transl. Into English of the Book "Problemy Kosmicheskoy Biologii. Tom 20: Matematicheskoye Modelirovaniye Biologicheskikh Sistem" Moscow, Nauka, 1972 160 p.

Descriptors: *Closed ecological systems, *Exobiology, *Mathematical models, Bionics, Dynamic programming, Microorganisms, Nonlinear programming, Populations, Volterra equations.

For abstract, see STAR 1206

PATENT-2 821 499 Not available NTIS
Department of the Interior, Washington, D.C.
METHOD FOR CONTROLLING SEA LAMPREYS (PETROMYZON MARINUS).
Patent,
Vernon C. Applegate, and John H. Howell. Filed 9 May 56, patented 28 Jan 58, 3p PAT-APPL-583 889, DOCKET/FWS-305
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Cyclostomata, *Lampreys, *Patents, *Pest control, Aquatic animals, Poisons, Larvae, Chemical compounds.
Identifiers: PAT-CL-167-30, Petromyzon marinus.

The invention relates to the control of sea lampreys (Petromyzon marinus), and more particularly, to the chemical treatment of the aquatic habitats in which the larval stage lives and grows during a period of from approximately four to five years.

PATENT-2 955 068 Not available NTIS
Department of the Interior, Washington, D.C.
METHOD FOR CONTROLLING BORING SPONGES AND OTHER PESTS OF COMMERICAL MOLLUSKS.
Patent,
Victor L. Loosanoff. Filed 10 Oct 58, patented 4 Oct 60, 3p PAT-APPL-766 624, DOCKET/FWS-362
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Pest control, *Patents, *Mollusca, *Porifera, Shellfish, Inorganic salts, Fisheries.
Identifiers: PAT-CL-167-14.

The invention relates to a method for controlling pests affecting commercially important mollusks. Concentrated solutions of water soluble inorganic salts may be employed effectively to control pests infesting shellfish beds. Sodium chloride is preferred since it is the cheapest and most readily available inorganic salt. However, where circumstances warrant, other salts may be employed, such as potassium chloride, calcium chloride, etc. The method simply, consists in removing the shellfish material from the sea bottom and contacting it with concentrated salt solution for a relatively short period of time, and then returning the shellfish material to the sea bottom. A period of air exposure is preferably included before returning the shellfish material to the water, but the process may be conducted without the air exposure step, if desired.

PB-228 587/2GA PC$9.50/MF$1.45
New Mexico State Univ., University Park. Water Resources Research Inst.
AN ANALYSIS OF MERCURIALS IN THE ELEPHANT BUTTE ECOSYSTEM.
Technical completion rept.,
John D. Garcia, David E. Kidd, and Gordon V. Johnson. Jan 74, 127p WRRI-035 OWRR-A-040-NMEX(2), W74-04859
Prepared in Cooperation with New Mexico Univ., Albuquerque. Dept. of Biology.

Descriptors: *Water pollution, *Mercury(Metals), *Fresh water biology, Lakes, Water analysis, Fishes, Spectrophotometry, New Mexico, Aquatic animals, Aquatic plants, Tissues(Biology), Chemical analysis, Seafood, Public health.
Identifiers: *Ecosystems, Water pollution effects(Animals), Water pollution effects(Plants).

Samples from Elephant Butte Lake collections were analyzed for mercury by a flameless atomic absorption procedure. Analyses revealed mean ppb mercury concentrations of 0.027 in water, 57 in bottom sediments, 109 in phytoplankton, 277 in attached algae and bryophytes, 95 in plant debris, 69 in zooplankton, 90 in crayfish muscle, 26 in visceral mass of mussels, 97 in muscle of non-predaceous fish, 125 in muscle of small predaceous fish, 253 in muscle of large predaceous fish, and 266 in muscle of two turtle species. Tissue grouped by relative levels for the sixteen fish species show consistently lower levels in bone, skin, gills, and eyes; intermediate levels in stomach, intestine, heart, and brain; and higher levels in spleen, muscle, kidney, and liver. The potential hazards of Elephant Butte fish to human health are discussed.

PB-228 643/3GA PC-GPO/MF$1.45-NTIS
Institute for Fisheries Research, Ann Arbor, Mich.
THE EFFECTS OF METHOXYCHLOR ON AQUATIC BIOTA.
Ecological research series,
James W. Merna, and Paul J. Eisele. Sep 73, 66p W74-04553, EPA-R3-73-046
Prepared in cooperation with Michigan Univ., Ann Arbor. School of Public Health.
Paper copy available from GPO $0.95 as EP1.23:73-046.

Descriptors: *Methoxychlor, *Pesticides, *Aquatic animals, Toxic tolerances, Toxicity, Animal physiology, Reproduction(Biology), Minnows, Perch, Crustaces, Fishes.
Identifiers: Gammarus pseudolimnaeus, Orconectes virilis, Pimephales promelas, Perca flavescens, *Water pollution effects(Animals).

Continuous-flow bioassays yielded 96-hour TL50 values for invertebrates ranging from 0.61 micrograms/liter for Gammarus pseudolimnaeus to 7.05 micrograms/liter for Orconectes virilis. Fathead minnows (Pimephales promelas) and yellow perch (Perca flavescens) had 96-hour TL50 values of 8.63 and 2.22 micrograms/liter respectively. Hatching of fathead minnow eggs was inhibited at all levels of exposure tested between 1.0 and 0.125 micrograms/liter. There was no spawing at 2 micrograms/liter. Growth of yellow perch was retarded at all levels tested between 5.0 and 0.625 micrograms/liter. All perch died at 10 micrograms/liter during the growth study. Perch which had been subjected to long-term exposure to 5 micrograms/liter of methoxychlor had an abnormally high oxygen demand when held in a respirometer with a water velocity of 0.6 foot per second.

PB-228 781/1GA PC$3.25/MF$1.45
Illinois Univ., Urbana. Center for Advanced Computation.
THE STRUCTURE OF ECOSYSTEMS. REVISED.
Special rept.,
Bruce Hannon. 30 Jan 73, 29p CAC-77 NSF-RA/N-73-031

Descriptors: *Biological productivity, Ecology, Biomass, Metabolism, Respiration, Systems analysis, Mathematical models.
Identifiers: *Ecosystems.

Input-output theory is developed for an ecosystem in terms of the production and respiration energy flows. The theory reveals a 'structure' of the system by demonstrating the direct and indirect energy glow dependence of each member of the system upon the others. A method for tracing the direct and indirect element flows thru the ecosystem is proposed. The structure is determined for two examples and a perturbation technique for the energy flow is suggested.

PB-228 818/1GA PC$8.25/MF$1.45
Illinois State Water Survey, Urbana.
THE RELATIONSHIP OF ILLINOIS WEATHER AND AGRICULTURE TO THE EASTERN COTTONTAIL RABBIT.
Technical rept. no. 4, 1971-73,
Stephen P. Havera. 30 Jun 73, 101p ISWS-73-CON-143
Contract DI-14-06-D-7197

Descriptors: *Rabbits, *Weather modification, *Illinois, Precipitation(Meteorology), Life cycles, Animal ecology, Snowfall, Seasonal variations, Farm crops, Abundance, Rainfall, Climate, Land use, Regression analysis, Water supply.
Identifiers: *Sylvilagus floridanus.

An investigation was made of the relationships of Illinois weather and crops to cottontail rabbit populations from 1955 through 1971. Such an investigation was desired to ascertain whether precipitation changes produced by weather modification might produce an effect on the ecosystem, as reflected in the rabbit population. Monthly weather parameters, weather factors during critical periods of the cottontail's life cycle, and crop acreages for four Illinois game regions were analyzed with cottontail data. Total snowfall for December through March preceding the hunting season appeared to correspond to the success of the cottontail rabbit harvest. (Modified author abstract)

SAN-807-X-3 PC$3.00/MF$1.45
San Diego State Univ., Calif. (Usa). Dept. Of Biology.
STUDIES ON THE PHYSICAL PROCESSES OF HEAT AND GAS EXCHANGE IN THE RED MANGROVE ECOSYSTEM. INTERIM REPORT AND PROPOSAL, JULY 1, 1973--JUNE 31, 1974.
P. C. Miller. 1973, 11p
Contract AT(04-3)-807

Descriptors: (*Trees, *Photosynthesis), (*Thermal effluents, *Biological effects), Biochemical reaction kinetics, Biological models, Carbon dioxide, Forests, Heat transfer, Leaves, Shores, Terrestrial ecosystems, Thermal pollution.

For abstract, see NSA 29 05, number 10166.

6G. Escape, Rescue, and Survival

PATENT-3 781 933 Not available NTIS
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
MODIFICATION OF ONE MAN LIFE RAFT.
Patent.
E. J. Soter. Patented 1 Jan 74, 4p NASA-CASE-LAR-10241-1,
Misc-Filed 29 Oct. 1971 Supersedes N72-21076 (10 - 12, p 1563).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Floating, *Inflating, *Life rafts, *Piercing, *Patents, Safety devices.

A one man inflatable life raft is described. The raft has an inflatable tube perimetrically bounding the occupant receiving space with a flexible floor member. A zippered opening in the floor allows entry and facilitates the use of a constant diameter tube. An airtight fabric bulkhead divides the peripheral tube longitudinally into inflatable tube sections, where if either tube section were punctured, the bulkhead would move into the punctured section to substitute for the punctured wall portion and maintain the inflatable volume of the tube. The floor member is attached to the central portion of the tube wall so that either side of the raft can be the up side.

6H. Food

AD-774 916/1GA PC$3.25/MF$1.45
Massachusetts Univ Amherst Dept of General Business and Finance
CONTRIBUTION OF MATHEMATICAL MODELS TO OPTIMIZING VOLUME FEEDING DECISIONS.
Technical rept.,
Joseph L. Balintfy. Feb 74, 30p Rept no. TR-14
Contract N00014-67-A-0230-0006

Descriptors: *Food dispensing, *Naval research, Mathematical models, Optimization, Attitudes(Psychology), Management.

Mathematical models clarify the issues involved in the measurement of food preferences and the use of this information to optimize the menus served to captive populations. A common interest exists between food managers and management scientists in the use of computers for achieving higher quality and better control in food service operations by these means. (Author)

CEA-CONF-2279 PC$3.00/MF$1.45
EVALUATION OF THE TOXICOLOGY OF IRRADIATED MAIZE STARCH: SUMMARY OF RESEARCH COMPLETED.
L. Saint-Lebe, G. Berger, A. Mucchielli, and B. Coquet. 15p CONF-721101-3, SM-166/7
In French. U.S. Sales Only.

Descriptors: (*Starch, *Radiopreservation), Diet, Irradiation, Maize, Microorganisms, Preservation, Quantitative chemical analysis, Radiolysis, Rats, Testing, Toxicity.

For abstract, see NSA 29 05, number 10356.

CEA-CONF-2280 PC$3.00/MF$1.45
PRELIMINARY STUDIES ON THE MICROFLORA OF MAIZE STARCH BEFORE AND AFTER IRRADIATION.
L. Saint-Lebe, A. Mucchielli, P. Leroy, and H. Beerens. 8p CONF-721101-4, SM-166/6
In French. U.S. Sales Only.

Descriptors: (*Starch, *Radiopreservation), (*Bacteria, *Radiosterilization), (*Fungi, Radiosterilization), Bacterial spores, Clostridium, Food, Gamma radiation, Irradiation, Lethal irradiation, Maize, Photon beams, Potatoes, Preservation, Radiation doses, Spores, Sterilization.

For abstract, see NSA 29 05, number 10357.

COM-74-10459/7GA PC$3.00/MF$1.45
Texas A and M Univ., College Station.
TEXAS SEAFOOD SYMPOSIUM.
Summary rept.
1974, 21p TAMU-SG-74-101 NOAA-74011617

Descriptors: *Seafood, *Economic analysis, *Food industry, *Texas, Meetings, Estuaries, Manpower, Land use, Fishing, Pollution, Land development, Bays(Topographical features), Coasts, Management, Reviews.
Identifiers: Sea Grant program, Corpus Cristi(Texas), Commercial fishing.

Highlights of the 'Symposium on the Economic Assessment of the Texas Seafood Industry' held August 13-14, 1973 in Corpus Christi are presented. Major reasons for concern are identified: Rising costs of vessel insurance (if available at all), limited availability of manpower, increased harvesting effort by both domestic and foreign ships (without corresponding increased yields), the closing of bays to commercial fishermen, estuarial encroachment by commercial land developers, industrial and residential pollution of estuaries and resource waters, political and bureaucratic entanglements and difficulties in resource and coastal zone management.

COM-74-10492/8GA Reprint
National Marine Fisheries Service, Seattle, Wash. Pacific Fishery Products Technology Center.
PREPARATION AND PROPERTIES OF SUCCINYLATED FISH MYOFIBRILLAR PROTEIN,
Herman S. Groninger, Jr. 18 Jul 73, 6p NOAA-74020110
Revision of report dated 16 Apr 73.
Pub. in Jnl. of Agricultural and Food Chemistry, v21 n6 p978-981 Nov/Dec 73.

Descriptors: *Food processing, *Fish protein concentrates, Proteins, Chemical properties, Succinic acid, Flavor, Odors.

The purpose of the study was to prepare succinylated protein from fish myofibrillar protein and to examine some of the chemical and functional properties of these products. Emphasis was on the preparation of a stable, dry product that possesses desirable functional properties.

COM-74-10513/1GA PC$3.00/MF$1.45
National Marine Fisheries Service, Seattle, Wash. Pacific Fishery Products Technology Center.
PREPARATION AND PROPERTIES OF CHEMICALLY AND ENZYMICALLY MODIFIED PROTEIN ISOLATES FOR USE AS FOOD INGREDIENTS,
J. Spinelli, H. S. Groninger, Jr., and B. Koury. May 73, 17p* NOAA-74020111
Pub. in proceedings of Food and Agriculture Organization Technical Conference on Fishery Products, 11-12 Apr 73, Tokyo, FII: RP/73/E-28 p1-12 May 73. Summary in French and Spanish.

Descriptors: *Fish protein concentrates, *Enzymes, *Aquaculture, Feeding stuffs, Animal nutrition, Food processing, Albumins, Fish farming, Emulsification, Food supplements, Lipids, Food processing industries, Fishing products, Additives.
Identifiers: *Food substitutes, *Food binders.

Enzymically-modified isolates were prepared by partially hydrolyzing the fish muscle with a proteolytic enzyme and then recovering the protein as a protein-phosphate complex. Stability, functional and organoleptic, was achieved by extracting the wet protein-phosphate complex first with isopropanol and then with water prior to drying. The properties of the fish protein isolates, such as their ability to emulsify lipids and their use as albumin substitutes in food systems, are discussed. Succinylated isolates were prepared by reacting fish muscle and succinic anhydride in an alkaline aqueous medium. Studies regarding their possible utility in food systems and as binders for fish feeds in aquaculture systems are discussed. (Modified author abstract)

COM-74-50189-01-01
(Order as COM-74-50189-01)
National Marine Fisheries Service, Pascagoula, Miss. Fishery Products Technology.
HOME FREEZING OF SEAFOODS,
Melvin E. Waters. 1974, 7p MFR-Paper-1026
NOAA-74013106-1
Included in Marine Fisheries Review, v36 n1 p1-6 Jan 74, COM-74-50189-01.

Descriptors: *Seafood, *Food processing, Freezing, Frozen foods, Fishing products, Food preparation, Food packaging, Food storage, Food deterioration, Proteins, Oxidation, Discoloration.

Significant advances in freezing technology have been made within the past six years. Information is given on the selection of seafood for home freezing, for its preparation, packaging and storing, and finally on the proper use of the frozen product. Three major causes of spoilage in foods which are minimized or inhibited by the freezing process are identified as protein degradation, oxidative rancidity, and brown discoloration. It is pointed out that use of starch solution and ascorbic acid deter oxidation.

COM-74-50189-01-04
(Order as COM-74-50189-01)
Army Natick Labs., Mass. Food Lab.
SOLUBILIZED FISH MUSCLE AS A FOOD BINDING MATERIAL,
Frederick J. King, Fred Heiligman, and Eugen Wierbicki. 1974, 4p USA-NLABS-TP-1419
NOAA-74013106-4, MFR-Paper-1029
Included in Marine Fisheries Review, v36 n1 p18-20 Jan 74, COM-74-50189-01.

Descriptors: *Food processing, *Fishes, Salts, Binding, Food storage, Shelf life, Food additives, Seafood, Sodium phosphates.
Identifiers: Fish muscles, *Food binders.

Comminuted fish flesh treated with certain salts serves as an effective food binding material. For experimental purposes solubilized fish binder was prepared by mixing minced fish flesh with an aqueous solution containing 3% NaCl and 0.5% TPP (sodium tripolyphosphate). During preparation and use of the binder the temperature was kept as low as possible. Storage life of the binder was from 0 to 4 days at 3C.

PATENT-3 745 020
Not available NTIS
Department of Agriculture, Washington, D.C.
PROCESS FOR PREPARING CITRUS PUREE.
Patent,
Bruce J. Lime, and Robert R. Cruse. Filed 5 May 71, patented 10 Jul 73, 4p PAT-APPL-140 615,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Citrus fruits, *Food processing, Homogenizing.
Identifiers: PAT-CL-99-100, Citrus puree.

Puree has been prepared from the whole orange fruit. This process can be further modified by a de-oiling step to yield a somewhat different orange puree. In the de-oiling process, the whole orange is submitted to an oil gland rupturing step, the oil is then removed with a fine water spray, the blanched orange is coarsely chopped, partially comminuted and unwanted hard portions and seeds removed by screen-type finisher, and finally the desired orange portions comminuted in a homogenizer to a particle size of 0.005 inch or less.

see prices of individual reports PC$3.25/MF$1.45
1973-74,
Final rept. 1920-1973.
5 issues49p*Scientific Literature Reviews on Generall

Literature from 1920 to 1973 relating to the safety of food additives is summarized. Chemical information, biological data, and biochemical aspects are discussed. For individual reports, see below:
FDABF-GRAS-195. Gluconate Salts. Feb 74, 49p, PC$3.25/MF$1.45 **PB-228 537/7GA**
FDABF-GRAS-196. Propionates and Thiodipropionates. Jan 74, 95p, PC$4.00/MF$1.45 **PB-228 538/5GA PB-228 538/5GA**
FDABF-GRAS-201. Dextrin and Corn Dextrin. Jan 74, 72p, PC$3.75/MF$1.45 **PB-228 539/3GA PB-228 539/3GA**
FDABF-GRAS-202. Papain. Jan 74, 88p, PC$4.00/MF$1.45 **PB-228 540/1GA PB-228 540/1GA**
FDABF-GRAS-203. Rennet (Rennin). Jan 74, 43p, PC$3.25/MF$1.45 **PB-228 541/9GA PB-228 541/9GA**

see prices of individual reports PC$3.75/MF$1.45
1973-74,
Final rept. 1920-1973.
6 issues60p*Scientific Literature Reviews on Generall

Literature from 1920 to 1973 relating to the safety of food additives is summarized. Chemical information, biological data, and biochemical aspects are discussed. For individual reports, see below:
FDABF-GRAS-185, TR-72-1552-40. Glycerophosphates. 17 Jan 74, 60p, PC$3.75/MF$1.45 **PB-228 543/5GA**
FDABF-GRAS-186, TR-72-1552-42. Hypophosphites. Jan 74, 24p, PC$3.00/MF$1.45 **PB-228 544/3GA PB-228 544/3GA**
FDABF-GRAS-187, TR-72-1552-39. p-Hydroxybenzyl Isothicoyanate. Dec 73, 12p, PC$3.00/MF$1.45 **PB-228 545/0GA PB-228 545/0GA**
FDABF-GRAS-188, tr-72-1552-37. Vegetable Oils, Oleic, and Linoleic Acids. Nov 73, 207p, PC$5.75/MF$1.45 **PB-228 546/8GA PB-228 546/8GA**
FDABF-GRAS-193, TR-72-1552-36. Gum Guaiac. Oct 73, 16p, PC$3.00/MF$1.45 **PB-228 547/6GA PB-228 547/6GA**
FDABF-GRAS-189, TR-72-1552-38. Sucrose. Dec 73, 204p, PC$5.75/MF$1.45 **PB-228 548/4GA PB-228 548/4GA**

see prices of individual reports PC$5.50/MF$1.45
1973-74,
Final rept. 1920-1973.
9 issues177p*Scientific Literature Reviews on Generall

Literature from 1920 to 1973 relating to the safety of food additives is summarized. Chemical information, biological data, and biochemical aspects are discussed. For individual reports, see below:
FDABF-GRAS-190. Magnesium Salts. Sep 73, 177p, PC$5.50/MF$1.45 **PB-228 550/0GA**
FDABF-GRAS-191. Hydrosulfites. Oct 73, 12p, PC$3.00/MF$1.45 **PB-228 551/8GA PB-228 551/8GA**
FDABF-GRAS-192. Sulfamic Acid. Oct 73, 45p, PC$3.25/MF$1.45 **PB-228 552/6GA PB-228 552/6GA**
FDABF-GRAS-194. Manganese Salts. Nov 73, 160p, PC$5.00/MF$1.45 **PB-228 553/4GA PB-228 553/4GA**
FDABF-GRAS-197. Silicates. Sep 73, 139p, PC$4.75/MF$1.45 **PB-228 554/2GA PB-228 554/2GA**
FDABF-GRAS-198. Fish Oils. Dec 73, 81p, PC$4.00/MF$1.45 **PB-228 555/9GA PB-228 555/9GA**
FDABF-GRAS-199. Tall Oil. Dec 73, 86p, PC$4.00/MF$1.45 **PB-228 556/7GA PB-228 556/7GA**
FDABF-GRAS-200. Hydrogenated Soy Bean Oil. Dec 73, 97p, PC$4.00/MF$1.45 **PB-228 557/5GA PB-228 557/5GA**

see prices of individual reports PC$4.00/MF$1.45
1973-74,
Final rept. 1920-1973.
9 issues85p*Scientific Literature Reviews on Generall

Literature from 1920 to 1973 relating to the safety of food additives is summarized. Chemical information, biological data, and biochemical aspects are discussed. For individual reports, see below:
FDABF-GRAS-204. Formic Acid and Derivatives. Jan 74, 85p, PC$4.00/MF$1.45 **PB-228 558/3GA**

6I. Hygiene and Sanitation

AD-775 126/6GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
ALLERGENIC PROPERTIES OF THE DUST FROM COTTON- AND FLAX-SPINNING MILLS,
A. A. Fetisova, S. M. Titova, and O. G. Aleksandrova. 11p
Edited trans. of Gigiena Truda i Professionalnye Zabolevaniya (USSR) v14 n5 p19-22 May 70, by Charles T. Ostertag, Jr.

Descriptors: *Dust, *Allergic diseases, *Textile industry, *Occupational diseases, Antigens, Cotton, Fibers, Industrial medicine, Microorganisms, Translations, USSR.
Identifiers: Allergens, Flax fibers, Skin tests.

Investigations included skin tests in workers of cotton and flax spinning mills, anaphylaxia with desensitization experiments in guinea pigs, along with staging of intradermal and scarification tests in sensitized animals. The following inferences were drawn: Industrial dust of cotton and flax-spinning mills in an allergen; positive skin tests are recorded not only in patients with impaired bronchopulmonary system but also in practically healthy subjects; antigenic properties of the industrial dust are due to the presence of bacteria and fungi; there is an affiliation between the dust generated at cotton and flax-spinning mills, conditioned by homogeneity of the fungal and bacterial flora.

COM-74-10474/6GA PC$4.00/MF$1.45
National Bureau of Standards, Washington, D.C. Technical Analysis Div.
A SURVEY OF THE SANITARY CONDITIONS OF MIGRANT LABOR CAMPS.
Final rept.,
Charles Fried, Robert Ramsburg, and Stephen Butler. Aug 73, 84p* NBSIR-73-248
Sponsored in part by Department of Health, Education and Welfare, Washington, D.C.

Descriptors: *Sanitation, *Residential buidlings, Health, Unskilled workers, Surveys, Investigations, Inspection, Water supply, Sewage disposal, Sanitary engineering, Toilet facilities, Questionnaires.

Identifiers: *Migrant workers, Migrant workers health project.

The Community Health Service (CHS) of the Department of Health, Education, and Welfare has been assigned the responsibility of providing health care services to migrant farmworkers. Since poor sanitation can be a major factor in the health of migrants, CHS requested NBS' Technical Analysis Division (TAD) to perform a field survey of the current state of the sanitary conditions of migrant housing. Field visits were made to migrant labor camps in five different regions of the United States. These regions were selected because they contained a large number of camps open at the time of the visits. Within each region, camps were selected on a modified random basis. A description of the findings of the survey is provided in both tabular and narrative form. A discussion of the limitations in the procedures used in conducting the survey is also included, and changes are suggested which could be incorporated into future surveys.

N74-14831/3GA PC$3.00/MF$1.45
Exotech Systems, Inc., Falls Church, Va.
SCIENTIFIC AND TECHNICAL SERVICES DIRECTED TOWARD THE DEVELOPMENT OF PLANETARY QUARANTINE MEASURES FOR AUTOMATED SPACECRAFT.
Quarterly Report, period ending 31 Dec. 1973.
7 Jan 74, 6p NASA-CR-136613, QR-3
Contract NASW-2503

Descriptors: *Planetary quarantine, *Spacecraft sterilization, Contamination, Documentation, Research and development, Technology utilization.

For abstract, see STAR 1206

6J. Industrial (Occupational) Medicine

PB-228 152/5GA PC$4.50/MF$1.45
National Inst. for Occupational Safety and Health, Rockville, Md.
CRITERIA FOR A RECOMMENDED STANDARD. OCCUPATIONAL EXPOSURE TO SULFUR DIOXIDE.
Final rept.
1974, 121p* NIOSH-TR-107-74
Contract HSM-99-72-116

Descriptors: *Sulfur dioxide, *Occupational diseases, *Industrial medicine, Toxicology, Legislation, Standards, Criteria, Exposure, Hazardous materials, Safety engineering, Industries.
Identifiers: Air quality criteria, Occupational Safety and Health Act of 1970.

The report presents the criteria and the recommended standard based thereon which were prepared to meet the need for preventing occupational diseases arising from exposure to sulfur dioxide. The proposed standard applies only to the processing, manufacture, and use of sulfur dioxide, or its release as an intermediate, byproduct, or impurity therefrom as applicable under the Occupational Safety and Health Act of 1970. These criteria were not designed for the population-at-large and any extrapolation beyond general occupational exposures is not warranted. These criteria were developed to ensure that the standard based thereon would protect against development of acute and chronic sulfur dioxide poisoning, be measurable by techniques that are valid, reproducible, and available to industry and governmental agencies, and be attainable with existing technology.

6K. Life Support

N74-14846/1GA PC$11.75/MF$1.45
Illinois Univ., Urbana. Dept. of Mechanical and Industrial Engineering.
PHYSIOLOGICAL AND ENGINEERING STUDY OF ADVANCED THERMOREGULATORY SYSTEMS FOR EXTRAVEHICULAR SPACE SUITS.
Final Report.
J. C. Chato, and B. A. Hertig. Aug 72, 192p NASA-CR-130811, ME-FR-400
Contract NGR-14-005-103

Descriptors: *Extravehicular activity, *Space suits, *Temperature control, Bioengineering, Body temperature, Heat pipes, Human factors engineering, Liquid cooling.

For abstract, see STAR 1206

6L. Medical and Hospital Equipment

AD-774 936/9GA PC$3.25/MF$1.45
Wheeler Industries Inc Washington D C
DESIGN CRITERIA FOR SHIPBOARD DENTAL SPACES: PROSTHETIC CERAMIC LABORATORY; CENTRAL STERILIZING ROOM; UTILITY ROOM.
Technical rept. 1 Oct 73-15 Jan 74,
Francis B. Merkle. Jan 74, 33p
Contract N00014-73-C-0179
See also report dated Aug 73, AD-766 080.

Descriptors: *Dentistry, Shipboard, Prosthetics, Sterilization, Facilities, Laboratories.
Identifiers: *Dental equipment, Design criteria.

The report takes into account the existing equipment limitations and shipboard constraints. Using the present state-of-the-art as a baseline, an outline of an R and D program will be developed. Accomplishment of such a program is expected to reduce or to eliminate, in future ships, the effects of the existing equipment limitations and shipboard constraints. The R and D program will be developed as the design criteria are worked out and will be incorporated in the final report. Additionally, these design criteria are intended to assist the Naval Ship Systems Command in designing and building shipboard dental spaces which will most efficiently and economically accomplish their purposes. They embody arrangements of modern types of equipment, which take advantage of recent advances in techniques and equipment design and, at the same time, require a minimum of space. It is expected that they will provide a rational basis for the usual structural and arrangement drawings. (Modified author abstract)

AD-775 010/2GA PC$10.50/MF$1.45
Naval Postgraduate School Monterey Calif
REGIONAL MEDICAL CENTERS: A MODEL FOR ANALYSIS AND MANAGEMENT.
Master's thesis,
Pieter Kingsland Van Winkle. Mar 74, 149p

Descriptors: *Medical services, Models, Management planning and control, Hospitals, Military medicine, Navy, Theses, Patients.
Identifiers: *Regional medical programs, *Regional medical centers.

A preliminary model for manpower and budget resource allocation in a Navy Regional Medical Center is formulated. Oakland Naval Hospital is used to illustrate the concept. A functional budget structure is proposed for management use in resource allocation decisions. Submodels of important supporting elements in the functional structure are developed. The problem of suitable definitions for patient category inputs is addressed. The model is suitable for use in analysis of many different types of health facilities with modification as discussed in the paper. (Author)

AD-775 429/4GA PC$3.00/MF$1.45
Edgewood Arsenal Aberdeen Proving Ground Md
ENHANCEMENT OF DRUG ABSORPTION AFTER ADMINISTRATION BY AN AUTOMATIC INJECTOR.
Technical rept. Jul 70-Aug 72,
Frederick R. Sidell, John E. Markis, William A. Groff, and Andris Kaminski. Feb 74, 18p* Rept no. EB-TR-73031

Descriptors: *Drugs, *Injectors, *Medical equipment, Absorption(Biological), Bioinstrumentation.

Drug absorption after administration by two self-injection devices was investigated in normal volunteer subjects. Seven subjects received atropine (2 mg) by conventional needle and syringe administration, by Syrette administration, and by AtroPen administration. Twelve subjects received pralidoxime chloride (600 mg) by needle and syringe and by ComboPen (a larger version of the AtroPen). Heart rate change and plasma concentration were the respective indices of absorption of atropine and pralidoxime. After AtroPen administration of atropine, the onset of tachycardia and time of maximal tachycardia occurred significantly ($p<0.02$) sooner than by the two other techniques. The oxime injected by the ComboPen produced a therapeutic plasma concentration in 66% of the time (3.7 and 5.7 minutes) needed after conventional administration. The spring-operated devices, the AntroPen and the ComboPen, are not only easy to operate, but they cause more rapid absorption of the drug. (Author)

COM-74-10468/8GA PC$6.25/MF$1.45
National Bureau of Standards, Washington, D.C. Technical Analysis Div.
CLINICAL LABORATORY PERFORMANCE ANALYSIS USING PROFICIENCY TEST STATISTICS.
Final rept., Jan 71-Mar 73,
Peter W. Finkel, and John W. Rowen. Dec 73, 63p NBSIR-73-197-1
Supersedes report dated Jun 73, COM-73-11253.

Descriptors: *Medical laboratories, Performance evaluation, Inspection, Performance standards, Performance tests, Personnel, Education, Regulations, Standards, State government, Licenses, Statistical analysis, Hematology, Microbiology.
Identifiers: Health services administration, Clinical chemistry.

The proficiency testing aspects of the Clinical Laboratory Improvement Act of 1967 program were assessed. The overall ability of licensed or volunteer laboratories to accurately determine mean values for any of the 13 constituents was not significantly altered during the first two years of program operation. However, the variability of the laboratories has decreased over the two-year period. It appears that the program has increased the consistency of laboratory performance. The general level of laboratory capability seemed to be independent of involvement in state-supported or voluntary proficiency testing programs other than the CDC program and of whether the working supervisor had a B.S., M.S., Ph.D., or M.D. degree. Choice of analytical method did significantly affect performance. Although insufficient evidence was available to make a definitive statement, the data do not appear to support arguments favoring establishment of method-dependent reference group target values.

PB-228 519/5GA PC$4.00/MF$1.45
McDonnell Douglas Astronautics Co., Richland, Wash. Donald W. Douglas Labs.
IMPLANTED ENERGY CONVERSION SYSTEM.
Annual rept. 8 Jul 71-7 Jul 72,
R. P. Johnston. Aug 73, 87p* MDC-G4411 PH-43-67-1408-5
Contract PH-43-67-1408-D

Descriptors: *Mechanical hearts, *Energy conversion heat sources, *Stirling cycle engines, Engines, Radioisotope heat sources, Power supplies, Control equipment, Implantation, In vivo analysis, Laboratory animals.

Identifiers: Cardiac assist devices, Blood pumps.

Engine 5 was life tested for nearly seven months of continuous operation. Approximately 500 million cycles were accumulated on potential life-limiting components such as the displacer flexural support and welded metal bellows seal with no evidence of incipient failure. Sealed vacuum insulation housing degradation was negligible. Engine power output degradation was negligible. System 5 performance was verified during animal in-vivo tests using a 52-watt plutonium-23 8 heat source developed by DWDL. System 5 volume is 1.8 liters. The projected System 6 volume is 1.3 liters, with 0.6 liter implanted in the thorax and 0.7 liter implanted in the abdomen.

PB-228 560/9GA PC$5.00/MF$1.45
Tecna Corp., Emeryville, Calif.
FABRICATION OF IMPLANTABLE ARTIFICIAL HEART DEVICES AND COMPONENTS.
Annual rept. no. 2, Dec 71-Dec 72,
T. C. Robinson, K. E. Buck, and S. Kitrilakis. Dec 72, 170p* NIH-71-2035-2
Contract PHS-71-2035
See also Annual rept. no. 1, PB-210 625.

Descriptors: *Mechanical hearts, Fabrication, Mechanical organs, In vivo analysis, Evaluation, Respirators, Humans.
Identifiers: *Cardiac assist devices, Intra aortic balloons, Blood pumps.

Production of standard non-distensible balloons yielded an acceptance rate of 94%, compared to the program goal of 75%. Distensible balloons were developed to achieve greater maximum non-occlusive pumping volumes in patients than standard balloons. A total of 52 balloons which distended uniformly from 30 ml to 70 ml volume were produced and tested. A pressure modulator was developed which controlled the volume of the balloon and permitted rapid balloon response. In vivo testing demonstrated a factor of two to three greater pumping effectiveness over standard balloons. Five model I compact, portable volume-cycled respirators were fabricated and underwent engineering and clinical evaluation. Functional improvements were identified and incorporated in the 10 model II respirators fabricated by the end of the contract period.

PB-228 789/4GA PC$3.25/MF$1.45
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
DEVELOPMENT OF BLOOD-COMPATIBLE MATERIALS: HEPARINIZED SURFACES AND PLATELET PROTECTIVE AGENTS.
Annual rept. 1 Dec 72-30 Nov 73,
G. A. Grode, J. P. Crowley, R. D. Falb, and R. I. Leininger. 20 Dec 73, 47p* PH-43-68-649-9
Contract PH-43-68-649
See also PB-216 085.

Descriptors: *Mechanical hearts, *Heparins, *Polymeric films, *Anticoagulants, Polymers, Blood, Blood coagulation, Surface chemistry, Complex compounds, In vitro analysis, Erythrocytes, Leukocytes, Platelets, Carboxylic acids, Fatty acids.
Identifiers: *Blood compatible materials, Biomaterials, Prostaglandins.

Work in the heparinization area indicates that the treatment is quite effective for use in high-flow shunting procedures for several hours. There are now also indications that the process is of definite value for long-term use in the reduction or elimination of thrombus formation and emboli production in high-flow, turbulent areas such as heart valves. Of continuing concern is the fact that the heparinized surface as well as unmodified surfaces provide a locus for the adhesion of platelets. Experimental work in this program is now being concentrated on methods to provide some platelet protective agent at the surface of the material. Recent work on the attachment of prostaglandin E1 indicates that surfaces having this agent covalently attached may well provide a significant degree of platelet protection. Current work indicates that surface-attached prostaglandin E1 is a potent inhibitor of platelet adhesion; however, contrary to prostanglandin in solution, the covalently attached prostaglandin does not inhibit normal platelet aggregation.

6M. Microbiology:

AD-774 906/2GA PC$4.00/MF$1.45
Microbiological Research Establishment Salisbury (England)
A COLLISON NEBULIZER GUN.
Technical note,
E. J. Morris, and G. H. Clement. Dec 73, 7p Rept no. MRE-TN-33

Descriptors: *Sprayers, *Bacterial aerosols, Bacteria, Equipment, Performance(Engineering), Great Britain.

The Collison nebulizer gun was developed for use in the spot testing of filters and enclosures in general where the requirement is for an aerosol of dried mono-dispersed bacterial particles which can be directed over a target area.

AD-774 979/9GA Reprint
Naval Medical Research Inst Bethesda Md
'PLASMODIUM LOPHURAE': THE ULTRASTRUCTURE OF THE EXOERYTHROCYTIC STAGES.
Medical research progress rept. no. 1,
R. L. Beaudoin, and C. P. A. Strome. 8 Feb 73, 27p
Availability: Pub. in Experimental Parasitology, v34 n3 p313-336 Dec 73.

Descriptors: *Parasites, Electron microscopy, Malaria, Blood, Erythrocytes, Plasmodium, Birds, Tissue culture, Cells(Biology), Pathology, Morphology(Biology), Life cycles.
Identifiers: *Plasmodium lophurae, Trophozoites.

The fine structure of the exoerythrocytic stages of Plasmodium lophurae was studied in specimens grown in tissue cultures of avian cells. Specimens were prepared for sectioning by a method which minimizes disturbance and permits precise selection and orientation specimens. Processes of the limiting membrane forming the host parasite interface were observed extending deply into the cytoplasm of the host cell and often appeared to form bridges between two or more parasites. The significance of this new observation is not yet established. (Author)

PATENT-3 291 400 Not available NTIS
Department of the Interior, Washington, D.C.
BACTERIA DISINTEGRATOR.
Patent,
Wayne I. Jensen. Filed 23 Sep 63, patented 13 Dec 66, 3p PAT-APPL-310 957, DOCKET/FWS-648
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Bacteria, *Grinding mills, Microorganisms, Cells(Biology), Disintegration.
Identifiers: PAT-CL-241-172.

The object of the present invention is to provide a simple and economic means for disintegrating microorganisms to obtain toxin with little chemical or physical change in the cell contents. It is a further object of the invention to provide an improved apparatus for rupturing cells contained in suspension with a grinding material in a flexible grinding tube.

PB-228 690/4GA PC$4.75/MF$1.45
National Inst. of Allergy and Infectious Disease, Bethesda, Md.
INTERFERON BIBLIOGRAPHY FROM MEDLARS, SEPTEMBER 1972-AUGUST 1973.
Interferon scientific memoranda.
Nov 73, 137p* Memo-976
Annex to November, 1973 Interferon Scientific Memoranda. See also PB-205 778.

Descriptors: *Antiviral agents, *Bibliographies, Viral diseases, Infectious diseases, Immunology, Microbiology, Virology, Nucleotides.
Identifiers: *Interferon.

The literature covered are those articles which have been cited in Index Medicus from September 1972 through August 1973. A list of all the journals covered as well as the abbreviations of the journal titles can be found in Index Medicus. The index of first authors consists of a listing of all entries appearing in Index Medicus during the stated period which had either the term interferon or viral interference as one of the associated index words. These have been arranged alphabetically by first author and appear in the second section of the bibliography. In addition to authors, title and citation, this section includes a listing of the Medical Subject Headings (MeSH) terms for each entry. The third section of the bibliography consists of a secondary author index with appropriate referrals back to the first author index. The subject index portion (first section of the bibliography) was generated by expanding the MeSH tracings associated with each entry.

TT-72-51071 PC$3.00/MF$1.45
Forest Service, Washington, D.C.
EFFECT OF VITAMINS B1 AND H AND GIBBERELLIN ON THE GROWTH OF THE FUNGUS FOIMITOPSIS ANNOSA (FR.) KARST (VLIYANIE VITAMINOV B1 I H I GIBBERELLINA NA ROST GRIBA FOMITOPSIS ANNOSA (FR.) KARST),
S. F. Negrutskii. 1973, 10p
Trans. of Nauchnye Doklady Vysshei Shkoly. Biologicheskie Nauki (USSR) n2 p144-147 1961. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Fungi, *Vitamin B complex, *Gibberelins, *Thiamine, Growth regulators, Hormones, Vitamins, Parasites, Plants(Botany), Translations, USSR.
Identifiers: Fomitopsis annosa, Butt rot fungus.

Vitamins gibberellin greatly influence the growth processes of plants. It was of interest to ascertain how vitamins B1(thiamine) and H(biotin) and gibberellin influence the growth of the fungus Fomitopsis annosa (Fr.) Karst. (root fungus), which is one of the most widespread and dangerous pests of coniferous wood species. From experimental data, it was possible to draw the conclusion that the root fungus belongs to those fungi, which do not require thiamine and biotin for their growth, and have the ability to synthesize these vitamins independently from the nutrients of the medium. The data also showed that gibberellin, introduced in the culture medium does not stimulate the growth of the mycelium, but on the contrary depresses the growth processes. Moreover, gibberellin retards the growth of the root fungus in any concentrations.

6N. Personnel Selection and Maintenance (Medical)

N74-14835/4GA PC$3.50/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Bad Godesberg (West Germany). Inst. fuer Flugmedizin.
QUALITATIVE IDENTIFICATION OF ORAL EFFECTIVE ANTIDIABETICA IN BLOOD SERUM OF HUMANS QUALITATIVER NACHWEIS ORAL WIRKSAMER ANTIDIABETICA IM BLUTSERUM DES MENSCHEN.
G. Schaefer. 6 Jul 73, 30p DLR-FB-73-88
In German; English Summary.

Descriptors: *Chemotherapy, *Diabetes mellitus, *Flight fitness, *Flying personnel, *Qualitative

analysis, Blood, Clinical medicine, Serums, Spectrophotometry, Thin layer chromatography.

For abstract, see STAR 1206

6O. Pharmacology

AD-775 475/7GA PC$3.00/MF$1.45
Istituto Di Ematologia Genoa (Italy)
COMPARATIVE STUDY OF ANTIMALARIAL AND OTHER DRUGS ON G6PD DEFICIENT RED CELLS.
Final technical rept. Dec 72-Nov 73,
E. Salvidio, G. Gaetani, F. Ajmar, R. Ravazzolo, and R. Ghio. Dec 73, 15p ERO-E-1551
Contract DAJA37-73-C-1494

Descriptors: *Antimalarials, *Drugs, Erythrocytes, Deficiencies, Enzymes, Hexoses, Hemolysis, Biochemistry, Italy.
Identifiers: *Dehydrogenase/glucose-6-phosphate, Hexose phosphates.

A sensitive in vitro method has been set up which measures the stimulation of the hexose monophosphate shunt (HMS) in normal and glucose-6-phosphate dehydrogenase (G6PD) deficient red blood cells. It has been used to measure and compare the stimulation produced by methylene blue, primaquine, sulphalene, fanasil, DFD and the experimental drug WZB 08271. These drugs stimulate the HMS in normal red cells but are unable to do so in G6PD deficient cells. In view of these results it is presumed that drugs capable of stimulating the HMS in normal red cells would cause lysis of G6PD deficient red cells in vivo. This prediction has been confirmed in studies using chromium labelled G6PD-deficient red cells in vivo. (Author)

6P. Physiology

AD-774 771/0GA Reprint
Harvard Univ Cambridge Mass Psycho-Acoustic Lab
BINAURAL SUMMATION--A CENTURY OF INVESTIGATION,
Ira J. Hirsh. 1948, 16p Rept no. PNR-53
Contract N5ori-7602
Previously announced as PB-93 980.
Availability: Pub. in Psychological Bulletin, v45 n3 p193-206 May 48.

Descriptors: *Auditory acuity, *Thresholds(Physiology), *Reviews, Experimental data, Hearing, Audio tones, Psychoacoustics.
Identifiers: *Binaural hearing, *Binaural summation.

The consideration of binaural hearing in general texts is very often limited to the phenomena of localization and binaural beats. A much neglected aspect of this topic is the ability of the binaural apparatus to summate stimuli that are introduced simultaneously in both ears. This review attempts to summarize experiments of the last hundred years that have revealed evidence for or against such binaural summation. Most of the evidence comes from the comparison or contrast of binaural and monaural sensitivity.

AD-774 774/4GA Reprint
Harvard Univ Cambridge Mass Psycho-Acoustic Lab
EQUAL-VOLUME JUDGMENTS OF TONES,
Garth J. Thomas. 29 Aug 48, 22p Rept no. PNR-62
Contract N5ori-7602
Previously announced as PB-97976.
Availability: Pub. in The American Jnl. of Psychology, v62 p182-201 Apr 49.

Descriptors: *Auditory acuity, *Audio tones, *Psychoacoustics, Volume, Test methods, Performance(Human), Contours, Frequency, Intensity.
Identifiers: Judgment.

A study in auditory acuity is reported in which subjects equated in volume two tones of different frequency, leading to the delineation of equal volume contours over a greater part of the total range of audible frequencies and intensities.

AD-774 775/1GA Reprint
Harvard Univ Cambridge Mass Psycho-Acoustic Lab
STATISTICAL BIAS IN COMPARISONS OF MONAURAL AND BINAURAL THRESHOLDS: BINAURAL SUMMATION OR BINAURAL SUPPLEMENTATION,
Moncrieff H. Smith, and J. C. R. Licklider. 4 Apr 49, 10p Rept no. PNR-72
Contract N5ori-7602
Previously announced as PB-100 128.
Availability: Pub. in Psychological Bulletin, v46 n4 v46 n4 p278-284 Jul 49.

Descriptors: *Auditory acuity, *Test methods, *Bias, Hearing, Ear, Statistical analysis, Thresholds(Physiology), Psychoacoustics.
Identifiers: *Binaural summation, *Binaural supplementation, Monaural binaural comparisons.

A number of papers have dealt with the problem of binaural summation at the absolute threshold of hearing: to what extent does central summation of excitation from the two ears make binaural hearing more sensitive than monaural hearing. Since few people have matched ears, the procedure has been (1) to measure the two monaural thresholds, (2) to handicap the better ear by an amount equal to the difference between the two monaural measures, and (3) with the ears thus equated to determine the binaural threshold. It is of interest, to inquire how great the bias is in the monaural-binaural comparison.

AD-774 778/5GA Not available NTIS
Toronto Univ (Ontario) Dept of Otolaryngology
CYTOCHEMICAL AND CYTOFUNCTIONAL STUDIES OF THE VESTIBULAR SYSTEM. FUNCTIONAL IMPLICATIONS WITH REGARD TO THE CONCEPT OF ENDOLYMPH CIRCULATION,
G. F. Dohlman. 1973, 16p DRB-Reprint-3854
Availability: Pub. in Adv. Oto-Rhino-Laryng., v20 p470-484 1973.

Descriptors: *Lymph, *Ear, *Vestibular apparatus, Circulation, Otorhinolaryngology, Absorption(Biological), Cells(Biology), Potassium, Ion exchange, Cytochemistry, Physiology.
Identifiers: *Endolymph, Pinocytosis, Thorium dioxide, Cell physiology.

Colloidal thorium dioxide as a marker injected into the endolymph demonstrated a stimulation of the pinocytotic activity of all non-sensory cells except the dark cells, which totally rejected the thorium, due to their specific surface charge. This is interpreted as an additional indication for the function of the dark cells as ion-exchanging cells pumping potassium ions into the endolymph, thereby creating a positive charge. The pinocytosis of the rest of the non-sensory cells has been regarded as most likely accounting for the absorption producing the 'radial flow' of endolymph. The use of the marker has further illustrated the process of pinocytotic uptake in the lysosomes and has partly indicated the disposal of the indigestible foreign bodies. Some cells have been totally damaged by the thorium. The cell debris from these cells, however, are not phagocytized by the cells in the peripheral labyrinth.

AD-774 923/7GA Reprint
Harvard Univ Cambridge Mass Psycho-Acoustic Lab
DESCRIPTION OF SOME MECHANICAL PROPERTIES OF THE ORGAN OF CORTI,
G. v. Bekesy. 30 Mar 53, 18p Rept no. PNR-136
Contract N5ori-7602
Availability: Pub. in Jnl. of the Acoustical Society of America, v25 n4 p770-785 Jul 53.

Descriptors: *Ear, *Biomechanics, Mechanical properties, Anatomy, Hearing, Psychoacoustics, Psychophysics, Vibration.
Identifiers: *Corti organ.

A short historical introduction is followed by a description of the technique for observing the organ of Corti in a lightly anesthetized guinea pig with the help of a slit lamp. The magnification was around 200 times, and stroboscopic illumination was used with a 1-kilowatt high pressure mercury-arc lamp. The relative stiffness of the Reissner's membrane, the tectorial membrane, the reticular membrane, and the Hensen cells were investigated with test needles. It was possible to demonstrate the earlier anatomical concepts of the stiffness of the reticular membrane and the pillars of Corti. The difference between the vibration pattern of a series of resonators in the sense described by Helmholtz and the pattern of traveling waves is described. The actual observation of the membranes in the organ of Corti showed only traveling waves during stimulation with a pure tone. (Modified author abstract)

AD-774 955/9GA Reprint
Harvard Univ Cambridge Mass Psycho-Acoustic Lab
ELECTRICAL RESPONSES TO ACOUSTIC CLICKS IN MONKEY: EXTENT OF NEOCORTEX ACTIVATED,
Karl H. Pribram, Burton S. Rosner, and Walter A. Rosenblith. 15 Oct 53, 12p Rept no. PNR-139
Contract N5ori-76
Prepared in cooperation with Institute of Living, Hartford, Conn. Dept. of Neurophysiology, Yale Univ., New Haven, Conn. Dept. of Psychology, and Massachusetts Inst. of Tech., Cambridge, Mass. Research Lab. of Electronics.
Availability: Pub. in Jnl. of Neurophysiology, v17 p336-344 1954.

Descriptors: *Cerebral cortex, *Psychophysics, *Auditory perception, Central nervous system, Stimulation(Physiology), Response(Biology), Auditory signals, Electrophysiology, Monkeys, Psychophysiology, Experimental data.
Identifiers: Neurophysiology.

The posterior half of the cortex of the supratemporal plane in the monkey has been related to the auditory system by anatomical and electrophysiological techniques (2, 11, 15, 20). One investigation has indicated that the posterior insula also is activated by stimulation of the auditory system (25, 27). In recent experiments on the cortex of the operculum, insula, and supratemporal plane, the customary resection was abandoned and the sylvian fissure was opened by gentle dissection and retracted by packing (16). The present study was undertaken in order to utilize this procedure in a reinvestigation of the extent of the cortex of monkey activated by acoustic stimulation. The unexplained difference in size between the relatively large area of 'auditory cortex' in rodent and carnivore and the comparable area in primate suggested that this new research might prove fruitful.

AD-774 958/3GA Reprint
Harvard Univ Cambridge Mass Psycho-Acoustic Lab
SOME ELECTRO-MECHANICAL PROPERTIES OF THE ORGAN OF CORTI,
Georg von Bekesy. 1954, 23p Rept no. PNR-149
Contract N5ori-76
Presented at the Meeting of the American Otological Society, Boston, Mass., 23-24 May 54.
Availability: Pub. in Annals of Otology, Rhinology and Laryngology, v63 n2 p1-21 Jun 54.

Descriptors: *Ear, *Biomechanics, *Bioelectricity, Vibration, Shear stresses, Psychophysiology, Response(Biology).
Identifiers: *Corti organ, Electromechanics, Cochlea.

The paper summarizes briefly how the vibration pattern of the cochlear partition can be determined, and how the cells in the organ of Corti change their direction of vibration along the partition for different frequencies. It explains why the short waves on the side of the helicotrema, which are so difficult to calculate, are probably not important physiologically. In the second part attention is called to the sheering forces in the cochlea because the organ of Corti seems to be a kind of mechanical transformer, which transforms small fluid pressures into larger forces on the surface of the cells. Further it is shown that the vibrations in the cochlea trigger electrical ac potentials and a large pool of dc energy is at its disposal for this purpose.

AD-774 962/5GA Reprint
Harvard Univ Cambridge Mass Psycho-Acoustic Lab
MICROELECTRODE STUDIES ON MEDIAL GENICULATE BODY OF CAT. II. RESPONSE TO CLICKS,
Robert Galambos, Jerzy E. Rose, Reg. B. Bromiley, and John R. Hughes. 30 Jul 51, 24p Rept no. PNR-111
Contract N5ori-7602
Availability: Pub. in Jnl. of Neurophysiology, v15 p359-380 1952.

Descriptors: *Auditory nerve, *Auditory perception, *Electrophysiology, Hearing, Stimuli, Response(Biology).
Identifiers: Neurophysiology.

The electrical response aroused in the medial geniculate body by clicks has been examined with microelectrodes. It consists of a slow-wave sequence, and spikes that represent the discharge of single neural elements. Each unit discharges at a relatively fixed time interval (latency) after delivery of the stimulus. A considerable variability is displayed by most units when responding to a succession of identical clicks. The effect upon response of varying the strength of the clicks has been studied. In general, the more intense clicks evoke unit responses more often and earlier in time. Spontaneous activity in single units is often observed. The capacity of each ear to arouse response at a given microelectrode position was tested. Different units in the same animal may respond to clicks applied to either ear, to the contralateral ear alone, and to the ipsilateral ear alone. A bias in favor of the contralateral ear appears, however, to exist.

AD-775 061/5GA Not available NTIS
National Research Council of Canada Ottawa (Ontario) Div of Biology
KALLIKREIN, KININ AND CELL PROLIFERATION,
G. L. Haberland, and J. W. Rohen. 1973, 17p
Presented at the Symposium on Physiological Properties and Pharmacological Rational (1st), Mainz, 18-19 Nov 72.
Availability: Pub. in Sonderdruck aus: Kininogenases Kallikrein, p131-145 1973.

Descriptors: *Cell division, Cells(Biology), Mitosis, Bone marrow, Thymus, Calcium, Stimulation(Physiology), Enzymes, Hormones, Canada.
Identifiers: *Kallikreins, *Kinins, *Cell physiology.

The Kallikrein-Kinin system may have a previously unforeseen role in the initiation of cell proliferation and tissue regeneration. The injection of a pancreatic Kallikrein into rats causes a marked stimulation of DNA synthesis and mitosis in the bone marrow and thymus. This mitogenic action appears to be calcium dependent and is probably indirect through the liberation of kinins. The feasibility of a mediation by kinins is provided by the fact that bradykinin strongly stimulates DNA synthesis and mitosis in suspensions of thymic lymphoblasts, an action which, like that of Kallikrein in the animal, is calcium dependent. It is believed that Kallikrein and its kinin products facilitate the mitogenic action of calcium itself. This is discussed in relation to the known effects of calcium and the control of mitogenesis.

AD-775 104/3GA PC$4.75/MF$1.45
Seville Univ (Spain) School of Medicine
ANALYSIS OF FACTORS MODULATING MORPHOBIOCHEMICAL DIFFERENTIATION OF NEURAL CENTERS INVOLVED IN OCCULAR MOTILITY AND PROPRIOCEPTION.
Final scientific rept. 1 Jun 72-1 Nov 73,
J. M. Genis-Galvez. 1 Dec 73, 33p EOARD-TR-74-2
Grant AF-AFOSR-2403-72

Descriptors: *Embryology, *Brain, Cells(Biology), Nuclei, Anatomy, Central nervous system, Vestibular apparatus, Proprioception, Motor reactions, Chickens, Experimental data, Spain.
Identifiers: Neuroanatomy, Mesencephalon.

An interim report is given of ovservations completed in a study of stained serial sections of 50 chick embryos of age varying from the third day of incubation to the day after hatching to determine the anatomical development of the interstitial nucleus. This report includes anatomical descriptions of interstitial nuclei from embryos of 4, 9, 10, 14 and 16 days. Prior to the present study only fragmentary information was available about the structure of this nucleus and its conncetions. The author believes this to be the first contribution of a serial analysis of the nucleus with alternate use of stain for neurofibrillae and for somatofibrillae. This nucleus is believed to be involved in the transmission of impulses to the motor nuclei of the midbrain, bulb, and spinal medulla, those sensory inputs derived from the vestibula nucleus; and thus to be involved in motor responses to vestibular input. (Author)

AD-775 123/3GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
A METHOD OF EXAMINATION OF THE DIRECT ACTION OF ALLERGENS ON THE FUNCTION OF THE ADRENAL CORTEX UNDER EXPERIMENTAL CONDITIONS,
A. P. Ado, V. I. Pytskiy, and V. A. Tomilets. 1 Feb 74, 12p Rept no. FTD-HT-23-590-74
Edited trans. of Patologicheskaya Fiziologiya i Eksperimentalnaya Terapiya (USSR) v14 n3 p55-59 May/Jun 70, by Bernard L. Tauber.

Descriptors: *Adrenal cortex, *Corticosteroid agents, Adrenal cortex hormones, Adrenal glands, Secretion, Physiology, Pathology, USSR, Translations.
Identifiers: *Allergens, Neurophysiology.

Under conditions of prolonged perfusion of the adrenal glands of dogs in situ by an artificial fluid, preliminary hypophysectomy is not needed. The stressed stimulation of the secretion of corticosteroids by the adrenal glands of intact dogs is removed by washing of the adrenal glands over the period of the first 30-40 minutes of perfusion, after which a more or less constant level of their secretion is established with some trend toward a reduction in the production of cortisol. At this time the adrenal glands retain sensitivity to adrenal cortex hormones.

AD-775 153/0GA MF$1.45
Utah Univ Salt Lake City Computer Science Div
SIMULATION OF ARBITRARY SHAPED BOUNDARIES FOR HEMODYNAMIC STUDIES.
Final technical rept.,
Roger K. Debry, and Harvey Greenfield. Jul 73, 286p Rept no. UTEC-CSc-73-128 RADC-TR-73-357
Contract F30602-70-C-0300, ARPA Order-0829
Availability: Available in microfiche only.

Descriptors: *Blood flow, Differential equations, Fluid flow, Rheology, Mathematical models, Computer graphics, Mechanical organs, Simulation.
Identifiers: Medical computer applications, Mechanical hearts.

The studies involve the solution of a system of non-linear, partial differential equations known as the Navier-Stokes equations. A particular requirement for hemodynamic studies is that a solution technique exists which allows flexible, arbitrarily shaped, no-slip boundaries to be defined in the model being studied. The technique which is developed in this report allows that kind of definition. It is a finite difference technique, based on the Marker and Cell method. Techniques for applying interactive computer graphics to the solution of hemodynamics problems involving flexible, arbitrarily shaped, no-slip boundaries are demonstrated for a particular problem. This problem involves the study of blood flow through a ball-type prosthetic heart valve. (Modified author abstract)

AD-775 214/0GA PC$4.00/MF$1.45
School of Aerospace Medicine Brooks AFB Tex
STUDY OF REGIONAL CEREBRAL CIRCULATION (KVOPROSU OB IZUCHENII REGIONARNOGO MOZGOROGO KROVOOBRASHCHENIYA),
E. I. Zharov, A. I. Martinov, V. S. Zadionchenko, G. G. Zinkin, and V. S. Zimin. 1973, 15p Rept no. SAM-TT-R-1193-1273
Technical trans. of Kardiologiya (USSR) v9 p73-79 Jul 69.

Descriptors: *Cerebrum, *Brain, *Blood circulation, Blood pressure, Carbon dioxide, Oxygen, Nitroglycerin, Translations, USSR.
Identifiers: Radioencephalography, Rheoencephalography.

Rheo- and radioencephalography were used to determine the cerebral circulation, the blood pressure in the central retinal artery of the eye, and the temporal artery to evaluate the state of cerebral hemodynamics. The values obtained in young, healthy, adult subjects for the blood pressure in the central retinal artery of the eye and the temporal artery were similar. Following the administration of nitroglycerin, there was a simultaneous decrease in the blood pressure of these vessels. The administration of nitroglycerin produced an increase in the carbon dioxide and oxygen pressures of the blood.

AD-775 265/2GA Reprint
Navy Medical Neuropsychiatric Research Unit San Diego Calif
HUMAN CEREBRAL BLOOD FLOW DURING SLEEP AND WAKING,
Richard E. Townsend, Patricia N. Prinz, and Walter D. Obrist. 13 Nov 72, 9p Rept no. NMNRU-72-50
Availability: Pub. in Jnl. of Applied Physiology, v35 n5 p620-625 Nov 73.

Descriptors: *Cerebrum, *Blood flow, *Sleep, *Brain, Blood pressure, Metabolism.

There is a growing body of evidence that increases in neuronal activity occur during rapid eye movement (REM) sleep. Cerebral metabolic rate is also thought to increase, based on indirect evidence that cerebral blood flow (CBF) is elevated during REM sleep in animals. The present study was designed to evaluate changes in human CBF during normal sleep in 11 young adults. A noninvasive regional CBF method was used involving the clearance of inhaled 133Xe, monitored extracranially. In all regions studied (temporal, precentral and occipital), CBF in the grey matter tissue compartment varied significantly according to the sleep or waking state. Depending on the brain region, CBF during REM sleep was elevated 3 to 12% above afternoon waking levels. In contrast, CBF during slow wave sleep was reduced 4 to 14%. These CBF changes could not be accounted for by variations in arterial CO2 or blood pressure,

and thus may reflect alterations in brain metabolism or in mechanisms controlling the cerebral circulation. (Author)

AD-775 387/4GA PC$3.75/MF$1.45
Texas Univ Austin Electronics Research Center
DETECTION OF REM, 1 SLEEP STAGE AND EYE MOVEMENT FROM BEAT-TO-BEAT HEART RATE.
Technical rept.,
F. J. Weber, A. J. Welch, F. B. Vogt, and P. C. Richardson. 6 Jun 73, 63p Rept no. TR-150
Contract F44620-71-C-0091

Descriptors: *Sleep, Heart, Electrophysiology, Spectrum analysis, Psychophysiology.
Identifiers: Sleep stages, *Heart rate.

Interest in using sleep stage patterns to determine the amount and quality of a pilot or astronaut's sleep has led to a series of Air Force sponsored studied. The ultimate goal of these studies is to be able to determine sleep stage from beat-by-beat heart rate data along (not using the EEG). Work performed at the University of Texas by Welch, et al, and Aldredge et al, has indicated that stage REM (rapid eye movement sleep) is refractory to detection by techniques which perform satisfactorily on the other sleep stages. In addition, the Welch algorithm performs more effectively when the times of occurrence of stage REM (or combined stages REM and 1) are already known. The purpose of this phase of study is to test the hypothesis that the occurrence of rapid eye movements can be detected by concurrent transient oscillations in the heart rate. A knowledge of REM occurrences would then greatly simplify recognition of the REM sleep stage. Alternatively, direct recognition of stage REM, 1 (stage REM + stage 1) sleep may be possible by spectral analysis of heart rate. Both possibilities are investigated. (Modified author abstract)

N74-14830/5GA PC$3.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
THE EFFERENT INNERVATION OF THE VESTIBULAR RECEPTORS.
G. Rossi. Jan 74, 15p NASA-TT-F-15231
Contract NASW-2481
Tran-Transl. Into English from Acta Oto-Laryngol (Uppsala), V. 58, 1964 p 230-238.

Descriptors: *Acetyl compounds, *Efferent nervous systems, *Ganglia, *Physiological responses, *Vestibules, Bioelectricity, Electrophysiology.

For abstract, see STAR 1206

PB-228 569-T/GA PC$4.00/MF$1.45
National Institutes of Health, Bethesda, Md. Translation Unit.
EXCRETION OF FSH AND STEROID HORMONES IN BREAST-CANCER PATIENTS UNDER CHEMOTHERAPY,
V. D. Sokolova, K. S. Sharoukhova, M. G. Goncharova, N. I. Muraveva, and K. D. Smirnova. Feb 74, 7p NIH-74-141
Trans. of Voprosy Onkologii (USSR) n18 n10 p19-22 1973, by P. DePorte.

Descriptors: *Drug therapy, *Malignant neoplasms, *Breast carcinoma, *Steroids, Gonadotropic hormones, USSR, Translations, Hormones, Endocrine glands, Excretion, Estrogens, Physiology.
Identifiers: *Follicle stimulating hormone, Menopause, *Cancer.

No distinct changes were observed in the excretion of estrogens, 17-ketosteroids, 17-oxycorticosteroids, and pregnanediol in menopausal patients with inoperable breast neoplasms while undergoing drug therapy. No differences were noted in the level of excreted steroid hormones as a function of the therapeutic effects of drug therapy in patients with breast neoplasms. A correlation between the clinical effect of drug therapy and FSH (follicle stimulating hormone) excretion was observed in the majority of the patients. Excretion increased in the course of successful therapy and decreased when the therapy was unsuccessful.

PB-228 669/8GA PC$5.50/MF$1.45
Illinois Univ., Urbana. Dept. of Computer Science.
A TWO COMPARTMENTAL MODEL OF THE RESPIRATORY SYSTEM.
Master's thesis,
Paul Robert Haskitt. Dec 73, 50p UIUCDCS-R-73-616

Descriptors: *Respiratory system, Simulation, Mathematical models, Responses, Respiration, Theses, Hypoxia, Compartment analysis, Biomathematics.

A simplified two compartmental model of the human respiratory system is presented. The model is used to study the steady state responses to hypoxia at altitude and sea level, carbon dioxide inhalation, and metabolic disturbances, and the transient response to metabolic disturbances.

TT-71-58015 PC$6.75/MF$1.45
Bureau of Sport Fisheries and Wildlife, Washington, D.C.
HEAT REGULATION IN BIRDS: AN ECOLOGICAL-PHYSIOLOGICAL OUTLINE,
I. A. Shilov. 1973, 288p
Trans. of mono. Regulyatsiya Teploobmena u Ptitis (Ekologo-Fiziologicheskii Ocherk), Moscow, 1968, by V. S. Kothekar. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Thermoregulation, *Birds, *Ecology, USSR, Translations, Animal physiology, Heat production(Physiology), Body temperature, Adaptation, Atmospheric temperature, Manuals.

The manual is based on original studies made by the author and also on the analysis of numerous literature sources. The problems of adaptive changes in heat production and heat transfer by adult birds are analyzed from the ecological standpoint, and the problems of natural reversible hypothermy are discussed. Also the role of adaptive behavior under unfavorable temperature conditions, the role of temperature factor in the course of biological cycles and dynamics of bird population have been examined.

6Q. Protective Equipment

AD-774 833/8GA PC$3.25/MF$1.45
Human Engineering Lab Aberdeen Proving Ground Md
METHOD FOR HUMAN FACTORS EVALUATION OF BALLISTIC PROTECTIVE HELMETS.
Technical memo.,
Hayden A. Scheetz, Bernard M. Corona, Paul H. Ellis, R. Douglas Jones, and R. Bradley Randall. Sep 73, 47p Rept no. HEL-TM-18-73

Descriptors: *Helmets, *Protective equipment, *Infantry, *Human factors engineering, Assessment, Surveys, Ratings, Weight, Shape, Suspension devices, Test methods.
Identifiers: M-1 helmets.

Several experiments and surveys were conducted to learn more about the relationship between helmet weight, shape and suspension for ballistic protective helmets. Surveys were conducted to develop rating scales suitable for field testing. Experiments were conducted using the rating scales as the dependent variable. Design guidance and testing methodology are suggested for development and for human factors evaluation for future ballistic protective helmets. (Author)

AD-774 954/2GA Reprint
Harvard Univ Cambridge Mass Psycho-Acoustic Lab
NEW TYPES OF EAR PROTECTORS,
Jozef Zwislocki. 19 Jun 52, 5p Rept no. PNR-129
Contract N5ori-76
Availability: Pub. in Jnl. of the Acoustical Society of America, v24 n6 p762-764 Nov 52.

Descriptors: *Ear protectors, Noise, Filters, Sound, Attenuation, Human factors engineering.
Identifiers: *Ear plugs.

In the construction of ear plugs the chief problem is to combine the necessary sound insulation with comfort and sufficient speech intelligibility. Ear plugs are described which fulfill these requirements to a reasonable degree. They can be used for the attenuation of all audible frequencies or, with minor adaptation, as low-pass filters attenuating the more dangerous high frequencies only. For maximum speech intelligibility, both kinds of sound insulation are adequate for steady noises, whereas the low-pass filter is better for intermittent noises, detonations, and noise that can be interrupted to permit communication. Extensive experiments in industry and the armed forces have shown that low-pass filters with a cut-off frequency of 1000 cps provide sufficient hearing protection in most situations. (Author)

PB-228 670/6GA PC$3.00/MF$1.45
National Inst. of Law Enforcement and Criminal Justice, Washington, D.C.
HEARING PROTECTORS FOR USE ON FIRING RANGES.
Mar 73, 17p NILE/CJ-STD-0102.00
Report on Law Enforcement Standards Program.

Descriptors: *Hearing, *Ear protectors, Standards, Deafness, Reviews, Headgear, Thresholds(Perception), Tests, Test equipment, Test ranges, Firing tests(Ordnance), Audiometry, Specifications, Police.
Identifiers: Earplugs.

The document outlines the purpose and scope of performance requirements and evaluation methods. After defining the terms used in the report, the authors delineate the standards and specifications which hearing protectors should meet. Detailed instructions are given as to the procedures to be followed in testing the effectiveness of ear plugs, ear muffs, and their use in combination. Items such as the testing room apparatus, test subjects, hearing threshold measurement, and the handling of the test results are covered. A brief state-of-the-art review of methods for evaluating hearing protectors is included at the end of the report.

6R. Radiobiology

AD-774 823/9GA PC$4.00/MF$1.45
Stanford Research Inst Menlo Park Calif
MORTALITY IN RATS EXPOSED TO CW MICROWAVE RADIATION AT 0.95, 2.45, 4.54, AND 7.44 GHZ.
Final rept. 1 Jul-31 Dec 73,
P. Polson, D. C. L. Jones, A. Karp, and J. S. Krebs. Jan 74, 94p Rept no. SRI-2777-FR
Contract DAAK02-73-C-0453

Descriptors: *Microwaves, *Radiation effects, Pathology, Histology, Lethal dosage, Rats, Laboratory animals, Dose rate, Respiratory system, Radiobiology, Mathematical models, Radiation dosage, Lung, Experimental data.
Identifiers: *Microwave radiobiology.

Dose-response (lethality) data have been obtained for rats exposed frontally to CW microwave radiation in the frequency range 0.9 to 8 GHz. Approximately 1400 male rats of the Sprague-Dawley strain have been exposed groups to four separate frequencies: 0.95, 2.45, 4.54, and 7.44 GHz. Power density levels have ranged from approximately 0.2 W/sq cm to 12 W/sq cm, and lethal exposure dura-

tions from approximately 10 sec to 300 sec. Gross and histologic evaluation of selected tissues from some 20 animals has been obtained. The cause of death has been established as congestion, hemorrhage, and obstruction of nasal passages and/or congestion, hemorrhage, and often edema of the lungs. The lethality data have been subjected to a probit analysis, yielding LD50 curves for each of the four frequencies, and the LD50 values have been empirically fitted with a mathematical model. (Modified author abatract)

AD-774 851/0GA PC$4.00/MF$1.45
Army Environmental Hygiene Agency Aberdeen Proving Ground Md
LASER HAZARDS BIBLIOGRAPHY,
David H. Sliney, William A. Palmisano, Paul D. Tveten, John P. Feaster, and Frank C. Bason. Jan 73, 99p*
See also AD-652 707.

Descriptors: *Lasers, *Bibliographies, *Radiation hazards, Radiation effects, Medical research, Skin(Anatomy), Eye, Safety devices, Protection, Attenuation, Atmospheres, Dosimetry, Pathology, Industrial medicine.
Identifiers: *Laser radiobiology.

The Laser Hazards Bibliography consists of 1,219 references in the open literature broken into subject categories which relate to general biological effects, the eye, the skin, laser safety, laser propagation in the atmosphere, and laser measurements. (Author)

AD-775 217/3GA PC$4.25/MF$1.45
Armed Forces Radiobiology Research Inst Bethesda Md
CONTINUOUS EXPOSURE OF RODENTS TO 10 TO THE 8TH POWER PULSES OF ELECTROMAGNETIC RADIATION.
Scientific rept.,
S. J. Baum, W. D. Skidmore, and M. E. Ekstrom. Dec 73, 22p Rept no. AFRRI-SR73-23

Descriptors: *Electromagnetic radiation, *Radiation effects, Radiation dosage, Cells(Biology), Hematology, Bone marrow, Chromosomes, Neoplasms, Rats, Experimental data.

The experiment tests the hypothesis that rapid rises and falls of electric and magnetic fields would adversely affect vital ionic and electrochemical processes at the molecular level in biological systems. Rodents were exposed to 10 to the 8th power pulses from the AFRRI electromagnetic pulse (EMP) simulator which provides five pulses per second with a peak electric field intensity of 447 kV/m, a 5-nsec rise time and 550-nsec 1/e fall time. When results obtained from EMP exposed animals were compared with those from controls no changes were observed in the number and production of rat bone marrow cells, the concentration of circulating neutrophils, lymphocytes and erythrocytes. Reticulocytes appear to have been elevated and platelets decreased; however, both counts remained within acceptable levels. No incidence of mammary tumors was observed in the female Sprague-Dawley rats. In leukemia-prone AKR/J male mice, leukemia did not occur earlier in EMP exposed animals, nor was the fraction of leukemic mice greater in this group when compared with the nonirradiated control mice. (Modified author abstract)

AD-775 554/9GA Reprint
School of Aerospace Medicine Brooks AFB Tex
FUNDUSCOPIC ALTERATIONS IN THE RHESUS MONKEY INDUCED BY EXPOSURE TO HEAVY IONS (0+8) 250 MEV/NUCLEON.
Journal publication Jan 72-Apr 73,
Fred N. Beckman, Charles H. Bonney, and David M. Hunter. 1974, 10p Rept no. SAM-TR-73-295
Contract NASA-T-64131
Availability: Pub. in Aerospace Medicine, p154-160 Feb 74.

Descriptors: *Radiation effects, *Retina, *Aerospace medicine, *Cosmic rays, Radiation hazards, Eye, Space flight, Radiation dosage, Monkeys, Experimental data.

The left eyes of 54 Rhesus monkeys have been exposed to accelerated 0+8 (250 MeV/nucleon). Beam flux ranged from 171 rads to 7,740 rads. Fundus photography was performed immediately prior to and immediately following exposure, at 24-48 hours postexposure and at 1, 2, and 5 weeks postexposure. Punctate hemorrhages of the retina were visible at 171 rads, the lowest exposure level utilized in this study. Acute radiation retinopathy consisting of geographic retinal hemorrhage and ischemic necrosis of the retina was not seen until total flux reached 1,000 rads. The marked reduction in latency of onset of radiation retinopathy is discussed, as is the behavior of very low doses of heavy ions interacting with the retina. (Modified author abstract)

BNWL-1764 PC$5.45/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
RADIOLOGICAL EVALUATIONS FOR ADVANCED WASTE MANAGEMENT STUDIES.
D. H. Denham, D. A. Baker, J. K. Soldat, and J. P. Corley. Sep 73, 79p
Contract AT(45-1)-1830

Descriptors: (*Radioactive waste disposal, *Radiation hazards), (*Radiation doses, *Mathematical models), (*Human populations, Radiation doses), Americium, Cesium 137, Diet, Environment, Food chains, Geology, Man, Plutonium, Radionuclide kinetics, Radionuclide migration, Strontium 90, Variations.

For abstract, see NSA 29 05, number 10476.

CEA-CONF-2235 PC$3.00/MF$1.45
INFLUENCE OF THE PRODUCTS OF RADIOLYSIS OF URACIL AND THYMIDINE ON THE BIOSYNTHESIS OF DNA OF EHRLICH'S ASCITES CELLS.
M. Polverelli, and R. Teoule. 5p CONF-720981-4
In French. U.S. Sales Only.

Descriptors: (*Uracils, *Radiolysis), (*Thymidine, Radiolysis), (*Dna, *Biosynthesis), Aqueous solutions, Ascites tumor cells, Ehrlich ascites tumor.

For abstract, see NSA 29 05, number 10347.

CEA-CONF-2252 PC$3.00/MF$1.45
Cea Centre de la Hague, 50 - Cherbourg (France).
VARIATIONS IN THE CONCENTRATION FACTOR OF EXP 60 CO IN THE MUSSEL, MYTILUS EDULIS L.
J. C. Amiard, and M. Le Lannou. 3p CONF-721146-1
In French. U.S. Sales Only.

Descriptors: (*Molluscs, *Radionuclide kinetics), (*Cobalt 60, *Uptake), Environment, Exoskeleton, Muscles, Water.

For abstract, see NSA 29 05, number 10486.

CEA-CONF-2253 PC$3.00/MF$1.45
USE OF INHALED AND INGESTED LEAD AS A METABOLIC MODEL IN RADIOTOXICOLOGY.
J. Lafuma. 6p CONF-721094-1
In French. U.S. Sales Only.

Descriptors: (*Lead, Metabolism), (*Metabolism, *Biological models), (*Radiation protection, Biological models), Environment, Gastrointestinal tract, Ingestion, Inhalation, Labelled compounds, Lead isotopes, Lungs, Mammals, Radioactive aerosols, Radionuclide kinetics, Toxicity.

For abstract, see NSA 29 05, number 10487.

CEA-CONF-2277 PC$3.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Grenoble, 38 (France).
MACRODOSIMETRY: APPLICATIONS IN RADIOPROTECTION.
H. De Choudens. 16p CONF-720567-4
In French. U.S. Sales Only.

Descriptors: Let, Microdosimetry, Radiation protection, Spatial dose distributions, Uses.

For abstract, see NSA 29 05, number 11679.

CEA-CONF-2302 PC$3.75/MF$1.45
Cea Centre d'Etudes Nucleaires de Grenoble, 38 (France).
CYTOGENETIC DATA.
C. Mouriquand, P. Jalbert, A. Chabanas, J. Malka, and C. Bachelot. 32p CONF-7209101-1
In French. U.S. Sales Only.

Descriptors: (*Leukemia, *Chromosomal aberrations), Biological radiation effects, Patients.

For abstract, see NSA 29 05, number 10388.

COM-74-50070/3GA Not available NTIS
National Bureau of Standards, Washington, D.C.
BETA-RAY DOSE IN TISSUE-EQUIVALENT MATERIAL IMMERSED IN A RADIOACTIVE CLOUD.
Final rept.,
Martin J. Berger. 1974, 12p
Sponsored in part by Atomic Energy Commission, Washington, D.C.
Pub. in Health Physics (England) v26 p1-12 Jan 74.

Descriptors: *Beta particles, *Dosimetry, Radioactivity, Fallout.

The radioactive-cloud immersion problem for beta-radiation has been treated schematically by assuming a semi-infinite air medium (source region) located adjacent to a semi-infinite water medium (tissue-equivalent target). The source region has been assumed to contain a uniform concentration of beta-emitting radionuclide, and calculations have been made of the absorbed-dose distribution (depth dose) in the water target. A leakage correction has also been made to estimate the reduction of absorbed dose that would occur if the target had lateral dimensions small compared to the beta-particle range in air. Depth-dose calculations have been carried out for various source spectra (including beta-ray as well as discrete electron spectra) for 15 radionuclides (rare gases) emitted by nuclear power plants into the atmosphere, and for 12 other commonly used radionuclides.

CONF-730952-7 PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
MICROSCOPIC DESCRIPTION OF ENERGY DEPOSITION IN TISSUE BY PION BEAMS.
J. E. Turner, R. N. Hamm, and H. A. Wright. 1973, 19p

Descriptors: (*Pions minus, *Energy losses), (*Tissues, *Charged-particle transport), Computer codes, Monte carlo method, P codes.

For abstract, see NSA 29 05, number 11681.

COO-3269-4 PC$3.00/MF$1.45
Thomas Jefferson Univ., Philadelphia, PA. (Usa). Hospital.
NINTH YEAR PROGRESS REPORT, AUGUST 1, 1972--JULY 31, 1973.
G. S. Shaber. 1973, 5p
Contract AT(11-1)-3269

Descriptors: (*Prenatal irradiation, *Biological radiation effects), (*Sense organs, *Delayed radiation effects), Age dependence, External irradiation, Hypothalamus, Nervous system, Photon beams, Radiation doses, Rats, X radiation.

For abstract, see NSA 29 05, number 10428.

FDA-74-8006 PC$13.60/MF$1.45
Bureau of Radiological Health, Rockville, MD. (Usa).
PHYSICS OF DIAGNOSTIC RADIOLOGY. PROCEEDINGS OF A SUMMER SCHOOL HELD AT TRINITY UNIVERSITY, SAN ANTONIO, TEXAS, JULY 12--17, 1971.
D. J. Wright. Nov 73, 597p

Descriptors: (*Biomedical radiography, *Lectures), Bone marrow, Diagnostic techniques, Dosimetry, Fluoroscopy, Gonads, Images, Medical personnel, Patients, Photographic films, Radiation doses, Radiation protection, X radiation, X-ray spectra.

For abstract, see NSA 29 05, number 10389.

FOA-4-4557-A-3 PC$4.00/MF$1.45
Foersvarets Forskningsanstalt, Stockholm (Sweden).
STUDIES ON PLANT ACCUMULATION OF FISSION PRODUCTS UNDER SWEDISH CONDITIONS. XIV. UPTAKE OF EXP 137 CS BY WHEAT AND TIMOTHY FROM SIX DIFFERENT SOILS AS INFLUENCED BY RATE OF K-FERTILIZATION AND BY TYPE AND RATE OF N-FERTILIZATION IN POT EXPERIMENTS.
E. Haak, and A. Eriksson. Oct 73, 39p
U.S. Sales Only.

Descriptors: (*Cesium 137, *Uptake), (*Wheat, *Radionuclide kinetics), (*Grass, Radionuclide kinetics), Clays, Fallout, Fertilizers, Nitrogen, Potassium, Radioecological concentration, Radionuclide migration, Root absorption, Soils, Sweden, Variations.

For abstract, see NSA 29 05, number 10495.

FOA-4-4559-A-3 PC$3.50/MF$1.45
Foersvarets Forskningsanstalt, Stockholm (Sweden).
STUDIES ON PLANT ACCUMULATION OF FISSION PRODUCTS UNDER SWEDISH CONDITIONS. XV. UPTAKE OF EXP 137 CS BY WHEAT AS INFLUENCED BY TYPE AND RATE OF N-FERTILIZATION UNDER FIELD CONDITIONS.
E. Haak, and A. Eriksson. Oct 73, 28p
U.S. Sales Only.

Descriptors: (*Cesium 137, *Uptake), (*Wheat, *Radionuclide kinetics), Chemical composition, Clays, Fallout, Fertilizers, Nitrogen, Radioecological concentration, Radionuclide migration, Retention, Root absorption, Sand, Soils, Sweden, Variations.

For abstract, see NSA 29 05, number 10496.

KFK-1829 PC$3.75/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Abt. Strahlenschutz und Sicherheit.
DIRECT MEASUREMENT OF BODY DOSE IN PERSONNEL DOSIMETRY.
E. Piesch. Aug 73, 35p
In German. U.S. Sales Only.

Descriptors: (*Personnel dosimetry, *Radiation doses), Calibration, Dosemeters, Organs, Phantoms.

For abstract, see NSA 29 05, number 11684.

LBL-2449 PC$6.75/MF$1.45
California Univ., Berkeley (Usa). Lawrence Berkeley Lab.
CAPILLARY PERMEABILITY AND LYMPH FLOW IN THE IRRADIATED RAT.
M. M. Graham, and E. L. Dobson. Nov 73, 93p
Contract W-7405-eng-48

Descriptors: (*Capillaries, *Biological radiation effects), (*Lymphatic system, Biological radiation effects), Dose-response relationships, Gamma radiation, Lymph vessels, Membranes, Permeability, Photon beams, Radiation doses, Rats, Whole-body irradiation.

For abstract, see NSA 29 05, number 10429.

ORNL-TM-3837 PC$6.25/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
FINAL REPORT ON POSTATTACK ECOLOGY.
S. I. Auerbach, P. B. Dunaway, and R. C. Dahlman. Dec 73, 83p
Contract W-7405-eng-26

Descriptors: (*Fallout, *Biological radiation effects), (*Gamma sources, *Gamma dosimetry), (*Beta sources, *Beta dosimetry), (*Gramineae, Biological radiation effects), Acute irradiation, Arthropods, Cesium 137, Chronic irradiation, Cobalt 60, Dose rates, Dose-response relationships, Environment, External irradiation, Manganese 54, Pollen, Radiation doses, Radiation sources, Radionuclide kinetics, Radionuclide migration, Rats, Response modifying factors, Rodents, Seeds, Simulators, Terrestrial ecosystems, Voles, Wild animals.

For abstract, see NSA 29 05, number 10379.

ORO-2583-11 PC$3.00/MF$1.45
Florida Univ., Gainesville (Usa). Dept. Of Agronomy.
CYTOLOGICAL STUDY OF RADIATION INDUCED ALTERATIONS IN CYTOPLASMIC FACTORS CONTROLLING MALE STERILITY IN CORN. PROGRESS REPORT, FEBRUARY 28, 1973--DECEMBER 1, 1973.
J. R. Edwardson. 1973, 20p
Contract AT(40-1)-2583

Descriptors: (*Maize, *Sterility), (*Mutations, *Radioinduction), Biological effects, Biological radiation effects, Cell constituents, Cytology, Cytoplasm, Disease resistance, Fertility, Fungi, Gamma radiation, Genetic variability, Irradiation, Males, Mitochondria, Mutagens, Nicotiana, Ornamental plants, Photon beams, Plant cells, Plants, Reproduction, Sorghum, Variations, Vicia, Viruses.

For abstract, see NSA 29 05, number 10377.

ORO-2583-12 PC$3.00/MF$1.45
Florida Univ., Gainesville (Usa). Dept. Of Agronomy.
(CYTOLOGICAL STUDY OF RADIATION INDUCED ALTERATIONS IN CYTOPLASMIC FACTORS CONTROLLING MALE STERILITY). PROGRESS REPORT, 1971--1973.
1973, 18p
Contract AT(40-1)-2583

Descriptors: (*Plants, *Sterility), (*Mutations, *Radioinduction), Beets, Biological effects, Biological radiation effects, Cell constituents, Conifers, Cytology, Cytoplasm, Disease resistance, Fertility, Fungi, Gamma radiation, Genetic variability, Irradiation, Maize, Males, Mutagens, Neurospora, Nicotiana, Ornamental plants, Photon beams, Sorghum, Variations, Vicia, Viruses.

For abstract, see NSA 29 05, number 10378.

PB-228 716/7GA MF$1.45
Bureau of Radiological Health, Rockville, Md.
REPORT OF STATE AND LOCAL RADIOLOGICAL HEALTH PROGRAMS, FISCAL YEAR 1972.
Annual rept.,
Lois A. Miller. Aug 73, 93p DHEW/FDA-74-8004
See also PB-219 991.
Paper copy available from GPO $1.10 as SN-1715-00059.

Descriptors: *Radiobiology, *Health physics, *Public health, Radioactive contaminants, Radiation hazards, Environmental surveys, Electric equipment, X ray irradiation, Radiology, Dosimetry, State government, Local government, Legislation, Statistical data, Tables(Data).
Identifiers: *Radiation control programs, Radiation control legislation.

The report is the twelfth of a series based on data collected during fiscal year reviews of 53 state and local radiological health programs. The resources and activities of state and local radiological health programs are presented and summarized from data collected as of June 30, 1972. Summary data are included for fiscal years 1967 through 1972. Resources include data on personnel, funds, and equipment. The program activity areas are basic planning and administration, x-ray survey and control, environmental surveillance, radioactive materials, electronic products, and other radiological health activities.

PB-228 791/0GA PC-GPO/MF$1.45-NTIS
Bureau of Radiological Health, Rockville, Md.
HEALTH PHYSICS IN THE HEALING ARTS. SEVENTH MIDYEAR TOPICAL SYMPOSIUM.
Symposium 11-14 Dec 73.
Mar 73, 655p DHEW/FDA-73-8029
Presented at the Health Physics Society Symposium, San Juan, Puerto Rico, 11-14 Dec 72.
Paper copy available from GPO $5.40 as stock no. SN1715-00055.

Descriptors: *Ionizing radiation, *Medicine, *Health physics, Medical personnel, Radiotherapy, Safety, Dentistry, Education, Cancer, X rays, Dosimetry, Radiation injuries, Ultrasonic frequencies, Meetings.
Identifiers: *Nuclear medicine.

The symposium was held to promote exchanges of information with respect to the status, progress, and future directions in certain areas of medical radiation exposure protection in the healing arts. The individual presentations discuss certain aspects of problems and potential problems relating to human health from the use of medical radiation in the healing arts, ranging from broad surveys and educational needs to specific considerations of instrumentation and biological effects.

PB-228 972/6GA PC-GPO/MF$1.45-NTIS
Food and Drug Administration, Rockville, Md.
ANNUAL NATIONAL CONFERENCE ON RADIATION CONTROL (5TH), PLANNING FOR PROTECTION, HELD AT PORTLAND, OREGON ON 6-10 MAY 1973.
Oct 73, 370p DHEW/FDA-74-8008
See also Annual rept. no. 4, PB-212 531.
Paper copy available from GPO $3.25 as stock no. 1715-00061.

Descriptors: *Health physics, *Radiation protection, Meetings, Control, Radiology, Medicine, Dentistry, Radiation hazards, Public health, Exposure, X rays, Radioactive contaminants, Nuclear power plants, Projects, Environments, Standards, Regulations, Radioprotective agents.

Participants representing State and major local radiation control programs, as well as Federal agencies, discussed mutual radiation control problems. 'Planning for Protection' was the theme for the 1973 meeting, which considered a number of approaches to reducing radiation levels in society, health, lives, livelihoods. In addition to formal presentations and educational seminars, the proceedings contain the reports of workshops and resolutions by the Conference of Radiation Control Program Directors.

SSI-1973-18 PC$3.25/MF$1.45
Statens Straalskyddsinstitut, Stockholm (Sweden).

MICRODOSIMETRY IN HIGH ENERGY ELECTRON AND EXP 60 CO GAMMA RAY BEAMS FOR RADIATION THERAPY.
L. Lindborg. Sep 73, 23p CONF-730968-3
B. U.S. Sales Only.

Descriptors: (*Electron beams, *Microdosimetry), (*Gamma radiation, Microdosimetry), Betatrons, Cobalt 60, Mev range 10-100, Phantoms, Radiotherapy, Tissue-equivalent materials.

For abstract, see NSA 29 05, number 11696.

SSI-1973-20 PC$3.00/MF$1.45
Statens Straalskyddsinstitut, Stockholm (Sweden).
MICRODOSIMETRY IN ELECTRON BEAMS.
L. G. Bengtsson, and L. Lindborg. Sep 73, 12p
CONF-731012-4
U.S. Sales Only.

Descriptors: (*Electron beams, *Microdosimetry), Biological radiation effects, Mev range 01-10, Mev range 10-100, Radiation doses, Radiobiology.

For abstract, see NSA 29 05, number 11697.

TID-26509 PC$3.00/MF$1.45
Saint Margaret'S Hospital, Boston, Mass. (Usa).
EFFECT OF IRRADIATION ON THE BIOCHEMICAL CHANGES OF MAMMALIAN CELLS IN THE ABSENCE AND PRESENCE OF PARTICULATE MATERIALS. FINAL REPORT.
A. J. Sbarra, and B. B. Paul. 6 Aug 73, 17p
Contract AT(11-1)-3517

Descriptors: (*Leukocytes, *Biological radiation effects), (*Phagocytosis, *Stimulation), Catalase, Guinea pigs, Halides, Hydrogen peroxide, Irradiation, Man, Photon beams, Radiosensitivity, Response modifying factors, Thiols, X radiation.

For abstract, see NSA 29 05, number 10393.

UR-3055-8 PC$14.25/MF$1.45
Rochester Univ., N.Y. (Usa).
NONSENSE SUPPRESSION IN YEAST.
S. W. Liebman. 1973, 245p
Contract AT(11-1)-3055

Descriptors: (*Yeasts, *Mutants), (*Gene recombination, *Radioinduction), Amino acids, Biological variability, Codons, Gene mutations, Genes, Metabolism, Mutagenesis, Recessive mutations, Rna, X radiation.

For abstract, see NSA 29 05, number 10358.

6S. Stress Physiology

AD-775 106/8GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
EXPERIMENTAL STUDY ON THE EFFECT OF GENERAL VIBRATION ON CERTAIN METABOLIC PROCESSES,
G. I. Rumyantsev, and A. M. Tambovtseva. 4 Feb 74, 9p Rept no. FTD-HT-23-1029-74
Edited trans. of Nauchno-Issledovatelskii Institut Gigieny, Moscow. Uchenye Zapiskii (USSR) p49-52 1968, by Marilyn Olaechea.

Descriptors: *Metabolism, *Vibration, *Stress(Physiology), Proteins, Vitamins, Industrial medicine, Translations, USSR.

There is a limited number of studies on the problem of the effect of vibration on biochemical indicators. In studies by M. I. Kuznetsov, Yu. F. Ulanov, N. L. Chelnikov (1959), Ye. I. Andreyeva-Galanina (1963) it was noted that the effect of general vibration greatly reduces the concentration of vitamins C, B1, and B2, and also causes a decrease in creatinine. Similar changes were noticed in concrete workers who had been subjected to general vibration in plants which produced reinforced concrete items. In the present work studies were made of possible changes in a number of protein and vitamin metabolic indicators in animals under the effect of general vibration at frequencies of 20 and 50 Hz and amplitudes of 50, 200, and 400 microns. For this purpose the authors determined the total concentration of albumin, albumin fractions, and vitamin C in the blood and vitamins of the B group in the urine and studied the intensity of the redox processes.

AD-775 119/1GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
PROBLEM OF CORONARY INSUFFICIENCY IN PATIENTS SUFFERING FROM VIBRATION DISEASE CAUSED BY THE EFFECT OF GENERAL VIBRATION,
A. G. Genkin. 4 Feb 74, 8p Rept no. FTD-HT-23-1028-74
Edited trans. of Nauchno-Issledovatelskii Institut Gigieny, Moscow. Uchenye Zapiskii (USSR) p46-48 1968, by Marilyn Olaechea.

Descriptors: *Coronary disease, *Vibration, *Stress(Physiology), Industrial medicine, Cardiovascular system, Translations, USSR.

From the first consultation with patients suffering from vibration disease one is struck by the number of complaints which might be associated with certain disturbances in the functional state of the cardiovascular system. Many molders complain of tachycardia, a sensation of interruption in the functioning of the heart, pains in the vicinity of the heart, and pains of an angiospastic nature in the arms and legs. The authors analyzed the complaints of 204 molders suffering from vibration disease caused by the effect of general vibration.

AD-775 325/4GA Reprint
Rochester Univ N Y School of Medicine and Dentistry
PATHOPHYSIOLOGY OF SHOCK SECONDARY TO UNDERWATER DECOMPRESSION SICKNESS,
A. T. K. Cockett. 1973, 10p
Contract N00014-67-A-0398-0008
Text in English; attached summaries in French, Italian, and Russian.
Availability: Pub. in Bulletin de la Societe Internationale de Chirurgie, n2 p229-237 1973.

Descriptors: *Decompression sickness, Pathology, Physiology, Blood plasma, Blood volume, Embolism, Gas embolism, Lung, Therapy, Dextran, Heparin.

A plasma deficit usually develops after decompression sickness. Gaseous and lipid emboli probably trigger the pathophysiologic mechanisms. Dextran (70) or colloidal replacement will improve survival rates. The lungs are a major target organ. Pulmonary lung scans are a useful means of localizing emboli. The role of heparin is still conjectural.

N74-14793/5GA PC$11.75
George Washington Univ., Washington, D.C. Medical Center.
BIOMAGNETISM: A ANNOTATED BIBLIOGRAPHY.
Biological Sciences Communication Project.
L. A. Manganelli. Feb 72, 193p NASA-CR-136616, GW-BSCP-72-04R
Contract NSR-09-010-027

Descriptors: *Abstracts, *Bibliographies, *Biological effects, *Magnetic fields, Aerospace medicine, Animals, Clinical medicine, Human body, Magnetic effects, Plants (Botany).

For abstract, see STAR 1206

N74-14813/1GA PC$11.25/MF$1.45
National Aeronautics and Space Administration. Wallops Station, Wallops Island, Va.
REGULATORY BIOLOGY: DEPRESSED METABOLIC STATES.
E. M. Holton. Aug 73, 181p NASA-TM-X-69354
Conf-Symp. Held at Wallops Island, VA., 18-20 Oct. 1971.

Descriptors: *Conferences, *Exobiology, *Hypothermia, *Mammals, *Metabolism, *Thermoregulation, Acceleration stresses (Physiology), Biocontrol systems, Cancer, Controlled atmospheres, Gravitational effects, Hibernation.

For abstract, see STAR 1206

N74-14826/3GA PC$3.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
EFFECT OF PROLONGED HYPOKINESIA ON CERTAIN FUNCTIONS OF THE OTORHINOLARYNGOLOGICAL ORGANS.
I. Y. Yakovlev, V. P. Baranov, and E. I. Matsnev. Jan 74, 17p NASA-TT-F-15275
Contract NASW-2481
Tran-Transl. Into English from Vestn. Otorinolaringol. (Moscow), V. 6, No. 6, 1967 p 45-51.

Descriptors: *Hypokinesia, *Otolaryngology, Audiometry, Bed rest, Cochlea, Coriolis effect, Tachycardia, Vestibular tests.

For abstract, see STAR 1206

N74-14828/9GA PC$3.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
STUDY OF VENOUS TONUS IN THE FOREARM DURING SIMULATED WEIGHTLESSNESS.
D. Kaiser, and O. H. Gauer. Jan 74, 3p NASA-TT-F-15228
Contract NASW-2481
Tran-Transl. Into English from Pflugers Arch. (West Ger.), V. 289, 1966 p R76-77.

Descriptors: *Hypotonia, *Temperature effects, *Vascular system, *Weightlessness simulation, Blood plasma, Relaxation (Physiology), Submerging.

For abstract, see STAR 1206

N74-14829/7GA PC$3.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
WATER AND SALINE BALANCES DURING PROLONGED IMMERSION IN A WATER BATH.
P. Eckert, C. Behn, O. H. Gauer, and K. Kirsch. Jan 74, 3p NASA-TT-F-15229
Contract NASW-2481
Tran-Transl. Into English from Pflugers Arch. (West Ger.), V. 297, 1967 p R70-71.

Descriptors: *Biological effects, *Electrolytes, *Submerging, *Water balance, Diuresis, Hematocrit, Proteins.

For abstract, see STAR 1206

N74-14832/1GA PC$3.50/MF$1.45
Techtran Corp., Glen Burnie, Md.
CERTAIN RESULTS OF THE MEDICO-BIOLOGICAL INVESTIGATION CONDUCTED IN THE GEMINI AND APOLLO PROGRAMS: CHANGE IN WEIGHT AND INDICES OF THE CARDIOVASCULAR SYSTEM IN ASTRONAUTS.
V. I. Kopanev, and Y. M. Yuganov. Jan 74, 28p
NASA-TT-F-15261
Contract NASW-2037
Tran-Transl. Into English from Izv. Akad. Nauk Sssr, Ser. Biol. (Moscow), No. 5, 1973 p 629-646.

Descriptors: *Apollo project, *Body weight, *Cardiovascular system, *Clinical medicine, *Gemini project, Astronauts, Biological effects, Dehydration, Postflight analysis.

For abstract, see STAR 1206

N74-14834/7GA PC$3.00/MF$1.45
Techtran Corp., Glen Burnie, Md.
SOME RESULTS OF BIOMEDICAL INVESTIGATIONS CONDUCTED DURING THE GEMINI AND APOLLO PROGRAMS (ALTERATIONS IN BLOOD AND SKELETAL APPARATUS, MINERAL AND ELECTROLYTE METABOLISM IN THE ASTRONAUTS).
V. I. Kopanev, and Y. M. Yuganov. Jan 74, 18p
NASA-TT-F-15270
Contract NASW-2485
Tran-Transl. Into English from Izv. Akad. Nauk Sssr, Ser. Biol. (Moscow), No. 6, Nov. - Dec. 1973 p 852-863.

Descriptors: *Apollo project, *Astronauts, *Clinical medicine, *Gemini project, *Physiological responses, Biomedical data, Electrolyte metabolism, Hemodynamic responses, Minerals, Musculoskeletal system, Postflight analysis.

For abstract, see STAR 1206

6T. Toxicology

COM-74-10491/0GA Reprint
Maryland Univ., College Park. Dept. of Poultry Science.
EFFECTS OF MERCURY AND SELENIUM ON SERUM TRANSAMINASE LEVELS OF QUAIL, HENS AND RATS,
S. O. Welsh, J. H. Soares, Jr., B. R. Stilling, and H. Lagally. 9 Oct 73, 13p NOAA-74020109
Also pub. as Maryland Univ., College Park. Agricultural Experiment Station. Contrib-4838 Scientific Article A1916.
Pub. in Nutrition Reports International, v8 n6 p419-429 Dec 73.

Descriptors: *Mercury poisoning, *Selenium, Cystine, Enzymes, Bioassay, Birds, Rats, Chickens, Poultry, Fish protein concentrates, Nutrients, Toxicity, Blood chemical analysis, Liver.
Identifiers: *Transaminases.

Three studies were conducted in an effort to quantitatively evaluate some of the early effects and nutrient interactions of methyl mercury (CH3-HG) in Cotournix quail, Leghorn hens, and Sprague-Dawley rats. Mercury was added to the diets at levels ranging from 0.5 to 32 ppm. In addition, selenium (Se), cystine, and fish protein concentrate were added in various combinations to some of the diets to test their effectiveness in alleviating Hg toxicity. Sera were analyzed for serum glutamic oxalacetic transaminase (SGOT) and serum glutamic pyruvic transaminase (SGPT). Results show that SGPT provided little information about the onset of CH3-Hg toxicity. SGOT activity proved to be a more responsive test and generally paralled other indications of CH3-Hg toxicity such as weight loss, nervous tremor, and abnormal egg production. (Modified author abstract)

PB-228 439/6GA PC$3.75/MF$1.45
Illinois Inst. for Environmental Quality, Chicago.
HEALTH EFFECTS OF ORGANOPHOSPHATE INSECTICIDES.
Final rept.
Jan 74, 58p* IIEQ-74-2

Descriptors: *Insecticides, *Organic phosphates, Malathion, Humans, Safety, Hazards, Toxicity, Industrial medicine, Public health.

The report identifies the health effects associate with exposure to organosphosphate insecticides. The study was undertaken because organophosphate insecticides are rapidly replacing organochlorines. While the organophosphates are generally less persistent in the environment than organocholrines, they are also considered much more toxic to man and insects. They act by inhibiting the enzyme chloinesterase, which disrupts the human nervous system. The following recommendations were made: Improvements should be made in the hazard warnings on labels to make them more clearly understood and more noticeable; tighter controls over unsafe storage and handling must be established; a system for grading pesticides on the basis of effectiveness, human safety, and lack of non-target effects should be adopted.

PB-228 520/3GA PC$9.00/MF$1.45
Little (Arthur D.), Inc., Cambridge, Mass. Life Science Div.
PRECLINICAL TOXICOLOGICAL STUDIES OF DICHLOROALLYL LAWSOME (ANSC 126771). PART II. INTRAVENOUS INFUSION STUDIES.
Final rept.,
Paul E. Palm, Michael W. Rohovsky, Elsie P. Arnold, and Peter C. Rachwall. 31 Dec 73, 437p
ADL-NCI-73-48
Contract N01-CM-33727
See also PB-226 485.

Descriptors: *Napthoquinones, *Antineoplastic agents, *Toxicology, *Malignant neoplasms, *Drugs, Blood chemistry, Laboratory animals, Dosage, Parenteral infusions, Dose rate, Lethal dosage, Liver, Pathology, Histology, Hematology, Pharmacology, Bioassay, Kidneys, Bone marrow.
Identifiers: Napthoquinone/dichloroallyl-hydroxy.

Data are presented from four studies conducted to evaluate the preclinical toxicity of the anticancer agent dichloroallyl lawsone (NSC 126771) when administered by intravenous infusion on dosage regimes of x 1 (2-hr infusion), x 1 and x 5 (1-hr infusion) in dogs, and x 5 (1-hr infusion) in monkeys. For comparison selected data are included from Part I-Injection studies in dogs. Doses administered by intravenous infusion ranged from 0.49-125 mg/kg. Dogs which succumbed all died day 1 after dosages of 44.7-62.5 mg/kg when administered the drug by rapid injection, and 93.8-125.0 mg/kg when infused over a 1- or 2-hr. period. Death occurred in monkeys after three or four doses of 31.2 mg/kg or single doses of approximately equal to or more than 46.9 mg/kg given by 1-hr infusion. The liver appeared to be the primary site of drug toxicity in dogs and monkeys which survived the initial dose, and elevated but readily reversible levels of serum glutamic pyruvic transaminase (SGPT) and serum glutamic oxaloacetic transaminase (SGOT) appeared to be the earliest and most reliable indicators of meaningful toxicity. Hematuria, bilirubinuria, and glycosuria were also observed. (Modified author abstract)

PB-228 521/1GA PC$6.00/MF$1.45
Little (Arthur D.)., Inc., Cambridge, Mass. Life Sciences Div.
SPECIAL TOXICOLOGICAL STUDY OF F3TDR (NSC 75520) ADMINISTERED BY THE INTRACENOUS ROUTE IN MONKEYS FOR NINETY DAYS, INCLUDING ANALYSES OF THE TOTAL FLUORINE CONTENT OF URINE AND SELECTED TISSUES.
Final rept.,
Paul E. Palm, Michael W. Rohovsky, M. Susan Nick, Peter C. Rachwall, and John T. Funkhouser.
28 Dec 73, 241p ADL-NCI-73-47
Contract N01-CM-33727

Descriptors: *Antineoplastic agents, *Toxicology, *Malignant neoplasms, *Drugs, *Uridine, Monkeys, Fluorine aliphatic compounds, Pyrimidines, Nucleosides, Laboratory animals, Blood chemistry, Dosage, Parenteral infusions, Dose rate, Lethal dosage, Liver, Pathology, Histology, Hematology, Pharmacology, Bioassay, Kidneys, Bone marrow.
Identifiers: Uridine/droxy-trifluoromethyl.

Adult rhesus monkeys were administered daily or weekly intravenous injections of the cancer chemotherapeutic agent F3TdR (NSC 75520) at dosages of 12.5, 25 or 50 mg/kg, or 200,400, 800 or 1200 mg/kg, respectively, for 90 days. A comparison of toxic effects observed indicated that smaller daily dosages were better tolerated. Drug-related deaths occurred after a single injection of F3TdR at levels of 400-1200 mg/kg. Severe liver involvement, confirmed histopathologically, was indicated clinically by elevated serum glutamic pyruvic transaminase (SGPT) values immediately after the initial treatment at dosages equal to or more than 200 mg/kg and was accompanied by increased bilirubin levels at dosages equal to or more than 400 mg/kg. These hepatic changes preceded erythropenia and/or leukopenia at the lower levels. Although clinical test values from animals receiving smaller daily doses of FeTdR also showed some liver involvement, the effect was less severe and occurred later. (Modified author abstract)

PB-228 526-T/GA PC$4.25/MF$1.45
National Institutes of Health, Bethesda, Md. Translation Unit.
PHARMACOLOGICAL ANALYSIS OF MAIN AND SIDE EFFECTS OF ANTICANCEROUS PREPARATION,
A. B. Syrkin. Feb 74, 22p NIH-74-208C
Trans. of unidentified Russian doctorial thesis, Moscow, 1972.

Descriptors: *Antimetabolites, *Antineoplastic agents, *Antibiotics, *Malignant neoplasms, Experimental data, Cardiovascular system, Laboratory animals, USSR, Translations, Theses, Pharmacology, Toxicology, Drug therapy, Kidney, Liver, Hematopoietic system, Chemical analysis, Dosage, Dose rate, Bioassay.

In a search for new antineoplastic drugs, emphasis is put on the pharmacodynamic properties of some alkylizing compounds, antimetabolites and antibiotics as observed in laboratory animals. Specifically the study involved the effect and influence on the cardiovascular system, kidney, hematopoietic system and regenerative power of the liver; study of the harmful action of the substances on tumorous and normal tissue; and study of the toxicity and therapeutic values of the different substances administered in different ways with the observation of direct and remote results. The experimental study also involved the establishing of adequate criteria for evaluating the therapeutic effect of substances to be recommended for clinical use.

PB-228 981/7GA PC$3.75/MF$1.45
South Shore Analytical and Research Lab., Inc., Islip, N.Y.
TOXICITY STUDIES ON NSC 132319, INDICINE, N-OXIDE FOLLOWING SINGLE I.V. ADMINISTRATION TO BEAGLE DOGS.
Antitumor agent rept.,
Nathan Rakieten, David A. Cooney, and Ruth D. Davis. 22 Oct 73, 66p SSARL-DPH-73-06
Contract PH-43-64-932

Descriptors: *Antineoplastic agents, *Toxicology, *Drugs, *Malignant neoplasms, Dogs, Bioassay, Parenteral influsions, Dosage, Lethal dosage, Pathology, Histology, Hematology, Blood chemical analysis, Bone marrow, Liver, Kidney, Respiratory system, Cardiovascular system, Lymphatic system.
Identifiers: *Indicine, N-oxide.

Following single I.V. administration of Indicine, N-oxide, NSC 132319, to beagle dogs 1200mg/kg was the lethal dose (LD), 600mg/kg was the toxic dose 'high' (TDH), and 300mg/kg was the toxic dose 'low' (TDL) but approximated the highest nontoxic dose (HNTD). At the LD overt toxic signs noted included hyperventilation, panting, emesis, anorexia, weight loss, rectal bleeding, prostration, preterminal bradycardia, leucopenia with a shift to the right in the WBC differential; hypoplasia of the bone marrow; sinusoidal and central venous congestion of the liver; nephrosis including diffuse dilatation in the proximal tubules and vacuolization of the lining cells of the tubules; interstitial capillary congestion with many hyalin and granular casts; focal mucosal and submucosal hemorrhage in the colon; acute tonsillitis;

hemolymphnode; extensive focal necrosis and hemorrhage and venous congestion of the thymus; congestion of the lung with pulmonary edema, emphysema and patchy atelectasis. Toxic signs noted at the TDH included emesis, slight weight loss during the first few days of the study with no overt toxic signs thereafter, leucopenia with a shift to the right in the WBC differential, transient increases in SGOT and SGPT with no gross or histopathology. No overt toxic signs were noted at the TDL-HNTD. During a prolonged observation period no delayed effects of the drug were noted.

PB-228 999/9GA PC$5.75/MF$1.45
Battelle Columbus Labs., Ohio.
NSC-132313: PRECLINICAL TOXICITY OF INTRAVENOUS INJECTIONS IN DOGS AND MONKEYS.
Research rept. 6 Nov 72-31 Dec 73,
Roger M. Folk, Kenneth L. Pavkov, Daryl C. Thake, Charles Litterst, and Ruth D. Davis. 31 Dec 73, 225p BCL-RFKPDT-73-132313-1
Contract PHS-71-2262

Descriptors: *Antineoplastic agents, *Toxicology, *Malignant neoplasms, *Drugs, Bioassay, Parenteral infusions, Dogs, Monkeys, Laboratory animals, Dosage, Hematology, Dose rate, Lethal dosage, Pharmacology, Intestines, Histology, Pathology, Lymph nodes, Bone marrow.
Identifiers: *Galactitols.

NSC-132313, an antineoplastic agent was submitted to a preclinical toxicologic evaluation in dogs and monkeys. Dogs injected intravenous died or became moribund from a single dose of 16 mg/kg (320 mg/sq m) or from five daily consecutive doses of 4 mg/kg (80 mg/sq m). Principal histopathology included severe lymphoid depletion, bone marrow hypoplasia, and necrosis of intestinal mucosa. Prior to death anorexia, adipsia, lethargy, and hemorrhagic diarrhea occurred. Dogs injected with single doses of 2 or 1 mg/lg (40 or 20 mg/sq m) or with five daily consecutive doses of 0.5 or 0.25 mg/kg (10 or 5 mg/sq m) survived and showed reversible toxicity. Monkeys injected intravenous with 5 daily consecutive doses ranging from 8 to 0.25 mg/kg (96 to 3 mg/sq m) showed the same toxicity as the dogs. A dose of 8 mg/kg (96 mg/sq m) was lethal to monkeys.

PB-229 000/5GA PC$7.50/MF$1.45
IIT Research Inst., Chicago, Ill. Life Sciences Div.
COMPARISON BETWEEN ORAL AND INTRAVENOUS TOXICITY OF MELPHLAN (NSC-8906) IN BEAGLES (L-SARCOLYSIN, L-PHENYLALANINE MUSTARD).
Final rept. 27 Nov 72-7 Sep 73,
Mary C. Henry. 12 Oct 73, 336p IITRI-TOX-28, IITRI-L6043-28
Contract PH-43-67-1141
Report on Study of Chronic Toxicity of Various Classes of Cancer Chemotherapeutic Agents.

Descriptors: *Antineoplastic agents, *Toxicology, *Malignant neoplasms, *Drugs, Bioassay, Lethal dosage, Dosage, Dose rate, Laboratory animals, Dogs, Bone marrow, Ingestion(Biology), Infections, Bacteria, Hematology, Parenteral infusions, Histology, Pathology, Blood chemical analysis, Urine.
Identifiers: *Melphalon.

Melphalan was administered to beagles by the oral and intravenous routes on dose regimens of single, five, and ten daily doses. Drug toxicity was greater after intravenous administration on all dose schedules. Mortality was delayed, and occurred one to two weeks after the initiation of treatment irrespective of regimen. Bone marrow depression was the chief toxic sign and a few dogs succumbed to bacterial infection during the leukopenic phase. Alterations in dose regimen did not affect melphalan toxicity. Lethal and myelosuppression effects were similar when total doses administered were compared on the three dose regimens.

UR-3490-406 PC$4.00/MF$1.45
Rochester Univ., N.Y. (Usa).
EFFECT OF COMBINED EXPOSURE TO METHYLENE CHLORIDE AND ETHANOL IN GUINEA PIGS.
M. F. Balmer. 1973, 37p

Descriptors: (*Chlorinated aliphatic hydrocarbons, *Biological effects), (*Organic chlorine compounds, Biological effects), (*Ethanol, Biological effects), Alkenes, Guinea pigs, Toxicity.

For abstract, see NSA 29 05, number 12492.

7. CHEMISTRY

7A. Chemical Engineering

AD-775 152/2GA PC$4.50/MF$1.45
Houston Research Inc Tex
CYANIDE DISPOSAL BY OZONE OXIDATION.
Final rept. Apr 72-Nov 73,
Richard L. Garrison, Charles E. Mauk, and H. William Prengle, Jr. Feb 74, 112p* Rept no. HRI-7149 AFWL-TR-73-212
Contract F29601-72-C-0065

Descriptors: *Cyanides, Metal complexes, Oxidation, Ozone, Water pollution, Electroplating, Color film, Photographic processing equipment, Waste treatment, Mass transfer, Reaction kinetics, Prototypes, Fabrication.
Identifiers: *Water pollution control, *Industrial waste treatment, Chemical removal(Water treatment), Water pollution control equipment.

Aqueous cyanide and complexed metal cyanide wastes from the Air Force's routine electroplating operations and color photographic film processing require extensive treatment to satisfy stringent water quality standards. A process was developed by laboratory experimentation using ozone for the total destruction of cyanide and metal cyanide complexes. Mass transfer and kinetic rate constants were determined by experimentation. A pilot scale prototype was designed, fabricated, and operated to destroy actual Air Force cyanide wastes. In all cases, cyanide concentration in the effluent was reduced to below the detectable limit. A conceptual design of a full scale system to treat electroplating waste is included. (Modified author abstract)

AD-775 437/7GA PC$5.50/MF$1.45
Office of Oil and Gas Washington D C
VULNERABILITY OF TOTAL PETROLEUM SYSTEMS,
Maynard M. Stephens. May 73, 183p*
Contract DAHC20-70-C-0316

Descriptors: *Petroleum industry, *Civil defense, *Nuclear warfare, Vulnerability, Economics, Disasters, Pipelines, Tankers, Refining, Louisiana, Oil fields, Storage.
Identifiers: Natural gas.

The purpose of the report is to define or explain the operation of the petroleum industry and to disclose segments of vulnerability - Those activities which are subject to easy interruption and to serious potential damage, particularly from nuclear attack. Some readers of this report will not be experienced workers within the industry, therefore effort is made to discuss briefly the function of each segment of the petroleum and natural gas system. It is also the challenge of this study to develop methods to assess potential damage to the petroleum system and to estimate the impact of such damage on the flow of petroleum and its products to consumers. Critical segments of the industry, vulnerable to damage BY ANY MEANS, are danger areas that, if damaged, could seriously impair the normal functions, and also important functions in all of the interdependent and interrelated industries. After delineating the total petroleum and natural gas system, the study focuses on areas including all of Louisiana and a part of Mississippi. Louisiana was selected for this study so as to afford the opportunity to study the entire petroleum spectrum; the choice was wise since so much petroleum activity in all segments is concentrated in the area. Because of the overview the report gives of the industry and the data included, it also should be of interest to those wanting an overall picture of the industry and its economic relationships.

AEEW-R-876 PC$3.25/MF$1.45
Ukaea Reactor Group, Winfrith. Atomic Energy Establishment.
APPLICATION OF A DESIGN COMPUTER CODE TO DETERMINE THE OFF-DESIGN CHARACTERISTICS OF THE GIBRALTAR VERTICAL TUBE EVAPORATOR DESALINATION PLANT.
D. C. Guneratne. Mar 73, 23p
U.S. Sales Only.

Descriptors: (*Desalination, Evaporators), (*Computer codes, *M codes), (*Evaporators, *Performance testing), Specifications, Tubes.

For abstract, see NSA 29 05, number 12411.

PATENT-2 979 442 Not available NTIS
Department of the Interior, Washington, D.C.
PROCESS FOR THE PREVENTION OF SCALE IN SEA WATER EVAPORATORS.
Patent,
Walter L. Badger. Filed 28 Jun 57, patented 11 Apr 61, 7p PAT-APPL-668 824,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Scale(Corrosion), *Desalting, *Distillation, Sea water, Evaporators.
Identifiers: PAT-CL-202-57.

It is an object of this invention to provide a method for distilling sea water wherein hard scale formation is substantially prevented. It is a further object to prevent scale formation in the distillation of sea water so that long tube vertical evaporators may be effectively employed and to prevent scale from depositing on the heat transfer surfaces of a sea-water evaporator by maintaining in suspension in the said sea-water the scale forming ingredients, which comprise calcium carbonate, magnesium hydroxide and calcium sulfate, either alone or in an admixture.

PATENT-3 046 215 Not available NTIS
Department of the Interior, Washington, D.C.
ELECTROLYTIC CELL WITH VERTICAL MERCURY ELECTRODE.
Patent,
Paul M. Sullivan, and David H. Chambers. Filed 26 May 59, patented 24 Jul 62, 4p PAT-APPL-816 023, DOCKET/MIN-307
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Electrolytic cells, Mercury(Metal), Films, Liquid flow.
Identifiers: PAT-CL-204-219, *Mercury electrodes.

Horizontally disposed amalgam electrodes are commonly employed in various types of electrolytic processes. Serious disadvantages, however, attend their use since they require large mercury inventories, large floor areas, have low production rates per unit of electrode area, and are impractical for the recovery of high purity metals. Vertical mercury electrodes have been proposed, but the main difficulty has been in obtaining a uniform downwardly flowing sheet of mercury, which completely covers the supporting surface. Mercury films have a distressing tendency to separate into thin streams exposing the underlying plate. Broadly, the invention consists in a novel

supporting base for the flowing mercury film, said base being a sheet of hot-dipped galvanized iron. It was found that the use of hot-dipped galvanized iron for the electrode plate permits the mercury to wet the surface readily and without difficulty in a uniform film. Satisfactory operation for long periods of time have been achieved with this seemingly simple expedient. It is the primary object of this invention to provide an improved mercury electrode of superior design.

PATENT-3 088 909 Not available NTIS
Department of the Interior, Washington, D.C.
MIXED SOLVENTS FOR SALINE WATER EXTRACTION.
Patent,
Richard R. Davison, and Donald W. Hood. Filed 9 Feb 61, patented 7 May 63, 5p PAT-APPL-88 237, DOCKET/SAL-531
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Desalting, *Solvent extraction, *Amines, *Patents, Solubility.
Identifiers: PAT-CL-210-22.

Recently a method for the recovery of fresh water from saline waters employing various solvents, especially amines, has been proposed. Essentially, the method consists in employing solvents which have a large change in solubility for water at different temperatures, and which contain strong electro-negative atoms within the molecule that have the property of forming hydrogen bonds with water molecules. However, the presence of hydrophobic side chains in the solvent molecule draw the water-solvent couple into the solvent phase. It is the object of this invention to provide an improved solvent for the extraction of water of a lower salt content than the saline feed water which may be tailor made to fit predetermined temperature requirements for the extraction of saline waters. The solvent is a mixture of secondary and tertiary amines of relatively widely separated solubility curves.

PATENT-3 113 017 Not available NTIS
Department of the Interior, Washington, D.C.
METHOD FOR REACTING TITANIC CHLORIDE WITH AN ALKALI METAL.
Patent,
Vernon E. Homme. Filed 6 Jul 60, patented 3 Dec 63, 4p PAT-APPL-41 212, DOCKET/MIN-365
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Titanium chlorides, *Reduction(Chemistry), Refining, Liquid metals, Sodium.
Identifiers: PAT-CL-75-84-5.

This invention relates to an improved method and apparatus for reacting titanic chloride with molten sodium metal to produce a melt product of a titanium lower chloride and sodium chloride. This melt is primarily usable in a two-step reduction for producing high-purity titanium metal.

PATENT-3 138 637 Not available NTIS
Department of the Interior, Washington, D.C.
PROCESS FOR RECOVERING ETHYLENEDIAMINE-TETRAACETIC ACID (EDTA) FROM COPPER-EDTA-ION EXCHANGE EFFLUENT SOLUTIONS.
Patent,
Roald E. Lindstrom, and J. Oscar Winget. Filed 9 Jan 62, patented 13 Jun 64, 2p PAT-APPL-165 261, DOCKET/MIN-486
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *EDTA, *Materials recovery, *Precipitation(Chemistry), Ion exchanging, Rare earth elements, Chelate compounds, Calcium compounds.
Identifiers: PAT-CL-260-534.

The ion exchange method is commonly used in separation of the rare earth elements. The rare earths are usually obtained from ore concentrates of the oxides and are difficult to separate due to their great chemical similarity. It has been found that the ion exchange method employing a solution of ethylenediamine tetraacetic acid (hereinafter referred to as EDTA) as elutriant or eluting agent is very effective in separating the rare earth elements. Since the relatively high cost of EDTA contributes to the cost of the already expensive rare earth elements, the recovery of the EDTA for reuse is obviously highly desirable. This invention is concerned with a method for recovery of ethylenediamine tetraacetic acid from ion exchange effluent solutions containing copper-ethylenediamine tetraacctic acid complex.

PATENT-3 285 765 Not available NTIS
Department of the Interior, Washington, D.C.
CELLULOSE ACETATE REVERSE OSMOSIS DESALINATION MEMBRANES CAST FROM NONAQUEOUS SOLUTIONS AND A METHOD OF MAKING THE SAME.
Patent,
Charles R. Cannon. Filed 18 Oct 65, patented 15 Nov 66, 3p PAT-APPL-497 566, DOCKET/SAL-937
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Cellulose acetate, *Desalting, *Membranes, *Patents, *Casting, Osmosis.
Identifiers: *Reverse osmosis desalination, PAT-CL-106-187.

This invention relates to the demineralization of aqueous solutions for removing purified water and concentrating feed waters. In particular it relates to novel membranes produced by casting films from nonaqueous casting solutions, such as those comprising a cellulosic ester, an organic solvent, an alcohol, and a membrane swelling agent.

PATENT-3 289 753 Not available NTIS
Department of the Interior, Washington, D.C.
USE OF GOLD SURFACES TO PROMOTE DROPWISE CONDENSATION.
Patent,
Robert A. Erb. Filed 2 Nov 64, patented 6 Dec 66, 3p PAT-APPL-408 432, DOCKET/SAL-697
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Condensers(Liquefiers), *Gold, *Condensing, *Patents, Drops(Liquids), Heat transfer.
Identifiers: PAT-CL-165-133.

This invention is concerned with promotion of dropwise formation of water on the surfaces of heat transfer devices, particularly condensers. Advantages of dropwise condensation over film-type condensation, particularly in decreased thermal resistance between vapors to be condensed and the cooling fluid, is well known in the prior art. This patent discloses the use of zirconium and tantalum to promote dropwise condensation.

PATENT-3 289 754 Not available NTIS
Department of the Interior, Washington, D.C.
USE OF SILVER SURFACES TO PROMOTE DROPWISE CONDENSATION.
Patent,
Robert A. Erb, Edmund Thelen, and Richard D. Varker. Filed 2 Nov 64, patented 6 Dec 66, 4p PAT-APPL-408 433, DOCKET/SAL-699
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Condensers(Liquefiers), *Zirconium, *Tantalum, *Condensing, Drops(Liquid), Heat transfer.
Identifiers: PAT-CL-165-133.

This invention is concerned with promotion of dropwise formation of water on the surfaces of heat transfer devices, particularly condensers. Advantages of dropwise condensation over film-type condensation, particularly in decreased thermal resistance between vapors to be condensed and the cooling fluid, is well known. This patent discloses the use of zirconium and tantalum to promote dropwise condensation.

PATENT-3 290 286 Not available NTIS
Department of the Interior, Washington, D.C.
PARTIALLY HYDROLYZED CELLULOSIC REVERSE OSMOSIS MEMBRANES AND METHODS OF PREPARING THE SAME.
Patent,
Robert E. Kesting. Filed 18 Oct 65, patented 6 Dec 66, 4p PAT-APPL-497 565, DOCKET/SAL-827
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Desalting, *Membranes, Osmosis, Cellulosic resins.
Identifiers: *Reverse osmosis desalination, PAT-CL-260-230.

This invention relates to desalination membranes for use in reverse osmosis processes for separating water from aqueous solutions. In particular, it sets forth a novel treatment of cellulosic ester membranes wherein the membranes are particularly hydrolyzed to convert ester groups to hydroxyl groups. Also, it is related to the operation of reverse osmosis cells for water purification using novel membranes made by the method of this invention whereby increased water permeation rates and adequate salt rejection is obtained.

PATENT-3 323 653 Not available NTIS
Department of the Interior, Washington, D.C.
MULTIMEMBRANE APPARATUS FOR DEMINERALIZING LIQUIDS.
Patent,
Robert E. Lacey, and Norman L. Francis. Filed 20 Mar 63, patented 6 Jun 67, 6p PAT-APPL-266 768,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Demineralizing, Electrodialysis, Osmosis, Feedwater treatment.
Identifiers: PAT-CL-210-321.

The invention relates to improvements in a liquid purification unit having particular utility in electrochemical processes for the demineralization of liquids. One form of this improved unit comprises a multiplicity of thin-walled, narrow envelope-like cells in which flow liquid solutions. The unit according to the invention can be beneficially applied to carry out either electrodialysis or osmionic demineralization treatments of liquid solutions.

PATENT-3 323 857 Not available NTIS
Department of the Interior, Washington, D.C.
SELECTIVE EXTRACTION AND SEPARATION OF LANTHANIDES WITH A QUATERNARY AMMONIUM COMPOUND.
Patent,
Donald J. Bauer, and Roald E. Lindstrom. Filed 16 Dec 65, patented 6 Jun 67, 3p PAT-APPL-514 406, DOCKET/MIN-807
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Rare earth elements, *Patents, *Solvent extraction, Quaternary ammonium salts.
Identifiers: PAT-CL-23-23.

This invention relates to the separation of the elements in lanthanide mixtures from one another. The term 'lanthanide' as used in the present specification includes the lanthanide rare earth

elements having atomic numbers from 57 to 71 inclusive, and the element yttrium, atomic number 39. The object of this invention is to provide a new solvent extraction technique for efficiently and quickly separating lanthanides from one another. It has now been discovered that certain quaternary ammonium compounds can achieve desirable lanthanide separation results.

PATENT-3 332 894 Not available NTIS
Department of the Interior, Washington, D.C.
POLYVINYL CARBONATE DESALINATION MEMBRANE AND A METHOD OF PRODUCING THE SAME.
Patent,
Paul A. Cantor, and Robert E. Kesting. Filed 6 Dec 66, patented 25 Jul 67, 5p PAT-APPL-599 999, Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Membranes, *Desalting, Casting, Polycarbonate resins, Permeability.
Identifiers: *Reverse osmosis desalination, PAT-CL-260-2-5.

This invention is concerned with the production of novel membranes useful in reverse osmosis operation. The membranes are cast from a solution containing polyvinylene carbonate and may be formed into dried films or gelled membranes in single or multiple layers. Alternatively, the membranes may be partially hydrolyzed. Superior water permeabilities have been obtained using the membranes of this invention under reverse osmosis conditions.

PATENT-3 384 451 Not available NTIS
Department of the Interior, Washington, D.C.
PRODUCTION OF SPHERICAL GRANULES OF ALKALI EARTH PHOSPHATE SALTS.
Patent,
Charles J. A. Volz. Filed 22 Oct 65, patented 21 May 63, 3p PAT-APPL-502 700, DOCKET/SAL-803
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Fertilizers, *Inorganic phosphates, *Spheroidizing, Slurries, Dehydration, Inorganic salts.
Identifiers: PAT-CL-23-105.

The patent concerns a method for producing dehydrated particles of alkali earth phosphate salts having substantially spherical configurations. The method comprises heating a water slurry of said salts to dehydration temperature and agitating the slurry during dehydration.

PATENT-3 450 267 Not available NTIS
Department of the Interior, Washington, D.C.
POROUS MEMBRANE SUPPORT.
Patent,
Marvin A. Jarvis. Filed 28 Aug 67, patented 17 Jun 69, 4p PAT-APPL-664 243, DOCKET/SAL-1022
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Desalting, Supports, Porous materials, Osmosis.
Identifiers: *Membrane supports, Reverse osmosis desalination, PAT-CL-210-321.

This invention relates to porous backup plates which are used primarily as supports for membrane or filter materials in high pressure osmotic or filter applications. To serve as a backup plate, a material must be porous to allow passage of liquids or gases; it must possess great mechanical strength to withstand high pressure loadings, and it must be free from gross surface irregularities which could rupture or otherwise damage a membrane or filter.

PATENT-3 458 972 Not available NTIS
Department of the Interior, Washington, D.C.
METHOD OF DEAERATING SEA WATER.
Patent,
Ravinder K. Sood. Filed 11 Sep 68, patented 5 Aug 69, 3p PAT-APPL-758 931, DOCKET/SAL-1286
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Desalting, *Deaerators, Degassers, Sea water.
Identifiers: PAT-CL-55-54.

Evaporation is one method by which large quantities of sea water can be desalted for industrial and agricultural use. One of the problems encountered in evaporating sea water arises because untreated sea water is scale forming and highly corrosive to ordinary metals of construction, especially at the elevated temperatures reached in evaporators. However, the scale formation and corrosive action may be minimized by removing dissolved oxygen and carbon dioxide from the sea water. The patent describes a method of removing dissolved gases from sea water by using two adjacent deaeration chambers. Sea water heated in the final condenser of an evaporator system is introduced into a first chamber where a portion of it flashes to vapor, providing an atmosphere which facilitates the removal of dissolved gases. Cold sea water is introduced into the second chamber, wherein it is contacted with steam from the first chamber. Deaerated waters from both chambers are collected in a common sump and removed.

PATENT-3 463 713 Not available NTIS
Department of the Interior, Washington, D.C.
ELECTRODIALYSIS PROCESS USING INORGANIC ION EXCHANGE MEMBRANES.
Patent,
Jacob I. Bregman, David E. Anthes, and Robert S. Braman. Filed 13 Dec 66, patented 26 Aug 69, 4p PAT-APPL-601 824, DOCKET/SAL-1093
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Electrodialysis, *Ion exchange resins, *Membranes, *Demineralizing, Zirconium inorganic compounds, Thorium oxides.
Identifiers: PAT-CL-204-180.

The patent concerns demineralization of solution by electrodialysis using a zirconium phosphate cation exchange membrane and a thorium oxide anion exchange membrane.

PATENT-3 463 814 Not available NTIS
Department of the Interior, Washington, D.C.
CHEMICAL CYCLE FOR EVAPORATIVE WATER DESALINATION PLANT.
Patent,
Raymond E. Blanco, Walter E. Clark, and William C. Yee. Filed 24 Mar 67, patented 26 Aug 69, 7p PAT-APPL-626 377, DOCKET/SAL-978
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Desalting, *Patents, *Scale(Corrosion), Evaporation, Corrosion prevention, Feedwater treatment.
Identifiers: PAT-CL-260-555.

This invention relates to a method of preventing scale formation in saline water evaporators as well as to the recovery of valuable by-products in a saline water conversion. It includes: the contacting of saline water with an alkali containing sodium carbonate to precipitate out calcium carbonate, the recovery of purified water by the evaporation and condensation of a portion of the saline water, treating the calcium carbonate to form carbon dioxide, electrolyzing a portion of the concentrated brine to produce hydrogen, chlorine and caustic, and treating the caustic with a portion of the carbon dioxide to produce recycle sodium carbonate, as well as the production of urea using hydrogen from electrolysis and carbon dioxide. (Modified author abstract)

PATENT-3 476 654 Not available NTIS
Department of the Interior, Washington, D.C.
MULTISTAGE FLASH DISTILLATION WITH SCALE REMOVAL.
Patent,
Everett N. Sieder. Filed 29 Sep 67, patented 4 Nov 69, 4p PAT-APPL-671 895, DOCKET/SAL-1140
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Desalting, *Scale(Corrosion), Feedwater treatment, Corrosion prevention, Heat exchangers.
Identifiers: *Multistage flash distillation, PAT-CL-203-7.

One of the most difficult problems in the distillation of saline water to produce potable water remains the formation of scale on heat exchanger surfaces. In a multistage flash, evaporation process for distilling saline water, scale formation can be prevented by heating the saline water feed by indirect heat exchange with flashing vapors to a temperature slightly less than that which produces scaling, then further heating the feedwater by direct contact with steam to precipitate scale formers and thereafter separating the precipitated scale from the saline water feed. The patent discloses this process.

PATENT-3 477 942 Not available NTIS
Department of the Interior, Washington, D.C.
HYDROCARBON FUELS FROM COAL OR ANY CARBONACEOUS MATERIAL.
Patent,
Neal P. Cochran. Filed 28 Jul 67, patented 11 Nov 69, 9p PAT-APPL-656 954, DOCKET/OCR-1056
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Coal gasification, Liquefaction, Pyrolysis, Hydrocarbons.
Identifiers: PAT-CL-208-10.

This invention relates to the treatment of coal for the recovery of valuable hydrocarbon materials. More particularly, the invention concerns an arrangement whereby the hot char from a coal pyrolysis or hydrogasification is used to produce, in combination, electricity and producer gas containing hydrogen.

PATENT-3 782 904 Not available NTIS
National Aeronautics and Space Administration. Pasadena Office, Calif.
COMPACT HYDROGENATOR.
Patent.
P. G. Simmonds. Patented 1 Jan 74, 7p NASA-CASE-NPO-11682-1,
Misc-Filed 7 Oct. 1971 Supersedes N72-21474(10 - 12, p 1617). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Gas flow, *Gas injection, *Hydrogenation, *Molecular gases, Equipment specifications, *Patents, Product development, Systems analysis.

The development and characteristics of a hydrogenating apparatus are described. The device consists of a reaction chamber which is selectively permeable to atomic hydrogen and catalytically active to a hydrogenating reaction. In one device, hydrogen is pumped out of the reaction chamber while the reactant remains inside to remove molecular hydrogen so that more atomic hydrogen can pass through the walls. In another device, the reactant is pumped through the reaction chamber, and the hydrogen is removed from

the material leaving the chamber. The reactant is then cycled through the chamber.

PATENT-3 992 884 Not available NTIS
Department of the Interior, Washington, D.C.
PROCESS FOR THE REMOVAL OF SULFUR OXIDES FROM GASES.
Patent,
Daniel Bienstock, and Joseph H. Field. Filed 7 Oct 59, patented 18 Jul 61, 6p PAT-APPL-845 037, DOCKET/MIN-391
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Air pollution control, *Sulfur dioxide, Flue gases, Chemisorption, Aluminum oxides, Chromium oxides.
Identifiers: PAT-CL-23-2, Waste gas recovery.

It is an object of this invention to remove sulfur dioxide from hot gases containing SO2 by passing the gases over an absorbent comprising an alumina or chromia support having dispersed thereon an alkali metal oxide, such as sodium oxide. It is further object of this invention to regenerate the used absorbent with a hot reducing gas and recycle the so regenerated absorbent to the absorption stage.

PB-227 802/6GA PC$5.75/MF$1.45
Gulf General Atomic Co., San Diego, Calif.
REVERSE OSMOSIS MEMBRANE FILTERS FOR SEAWATER PRETREATMENT.
Final rept.,
G. E. Foreman, and S. S. Kremen. Feb 74, 52p Int-OSW-RDPR-74-926
Contract DI-14-30-3094

Descriptors: *Desalting, *Membranes, Osmosis, Cost estimates, Sea water, Pilot plants, Cellulose acetate, Flux(Rate).
Identifiers: *Spiral wound membranes, *Reverse osmosis desalination.

The objective of the program was to establish the technical and economic feasibility of two-stage seawater systems using low pressure spiral elements in a combined pretreatment/first-stage desalting step. Spiral-wound elements containing selected membranes were fabricated and tested on San Diego Bay water, and the effectiveness of low-presure pretreatment elements was evaluated by testing high-pressure spiral elements. Low pressure elements provided nominal water fluxes of 13 gal/sq ft-day with neglibible salt rejection at 50 to 180 psi 20% rejection at 250 psi, and 50% rejection at 500 psi. These elements responded well to the chemical flushing techniques used during testing. Economic analysis based on a plant having a size in the million gallon per day scale indicated that potable water could be obtained from seawater at an initial cost ranging between $1.25 and $1.50/1000 gallons.

PB-228 061/8GA PC$4.00/MF$1.45
Gulf Environmental Systems Co., San Diego, Calif.
DEVELOPMENT OF HIGH-PRESSURE SPIRAL MEMBRANE ELEMENTS FOR SEAWATER DESALINATION.
Research and development progress rept.,
F. K. Lesan, and R. B. Stackhouse. Sep 73, 76p Int-OSW-RDPR-73-879
Contract DI-14-30-2980

Descriptors: *Desalting, *Osmosis, Membranes, Performance evaluation, Pilot plants, Cellulose acetate.
Identifiers: *Spiral wound membranes, *Reverse osmosis desalination.

As a result of this study, an eight inch diameter spiral wound reverse osmosis module element and module, capable of sustained operation at 1000 psi and designed for use in the first pass of a two pass reverse osmosis seawater desalting plant were fabricated and field tested. Each of the elements contain 180 sq ft of active membrane area with the membranes fabricated through use of an Eastman 400-25 cellulose acetate and acetone/formamide system. During field evaluation testing of this module at the OSW San Diego Test Facility desalting natural seawater, membrane performance was about 30% less than the target goal of 12 gfd producing 3000 ppm TDS or better product water. The unexpectedly low flux experienced was attributable to a lack of sufficient experience and data for very-high salinity feeds. It was concluded that the results of this program should form a strong basis for future work in improving high-salinity membrane performance.

PB-228 668/0GA PC$12.25/MF$1.45
Scientific Research Instruments Corp., Baltimore, Md.
GASIFICATION OF FOSSIL FUELS UNDER OXIDATIVE, REDUCTIVE, AND PYROLYTIC CONDITIONS.
Final rept.,
A. L. Yergey, F.W. Lampe, M. L. Vestal, E. J. Gilbert, and G. J. Fergusson. Dec 73, 184p SRIC-72 EPA-650/2-73-042
Contract EPA-68-02-0206

Descriptors: *Coal gasification, Oxidation, Reduction(Chemistry), Pyrolysis, Lignite, Anthracite, Pressure, Gas analysis, Composition(Concentration), Reaction kinetics, Hydrocarbons.

The report contains kinetic reaction data produced in a non-isothermal kinetics laboratory while gasifying selected types of coal under oxidative, reductive, and pyrolytic conditions. Types of coal cover the range, including lignite and anthracite. Evolution of thermal decomposition products under study conditions were investigated at different fuel heating rates and gasification pressures. Gaseous product evolution rates, as the function of temperature, were graphed for different coals exposed to indicated gasification regimes. The evolution of such gaseous species as H2O, CO, CO2, O2, SO2, NO, H2, CH4, H2S, and C2H2 was followed up in conjunction with 13 different coal gasification reactions as identified previously and in the course of this work. The kinetic reaction parameters, such as activation energy and frequency factors for these reactions, were calculated and presented earlier and in this report.

7B. Inorganic Chemistry

AD-774 925/2GA PC$5.00/MF$1.45
Rocketdyne Canoga Park Calif
INORGANIC HALOGEN OXIDIZER RESEARCH.
Annual rept. 1 Apr-31 Dec 73,
K. O. Christe, C. J. Schack, R. D. Wilson, E. C. Curtis, and D. Pilipovich. 26 Feb 73, 163p Rept no. R-9454
Contract N00014-70-C-0294
See also report dated 26 May 72, AD-742 850.

Descriptors: *Halogen compounds, *Fluorides, *Perchlorates, Raman spectra, Fluorohydrocarbons, Synthesis(Chemistry), Oxidizers, Infrared spectra, Molecular vibration, Chemical reactions, Spectrum analysis, Nuclear magnetic resonance, Molecular structure, Oxides, Transition metals, Halides, Sulfur compounds.
Identifiers: Nuclear magnetic resonance(Fluorine 19), Ozonization.

The authors have continued to study the use of PtF6 for the synthesis of novel, high-oxidation state species. Several XeF5(+) salts were characterized by 19F nmr and vibrational spectroscopy, and force fields were computed. A novel and interesting reaction between O2(+) salts and various halogen fluorides was discovered. A novel halogen perchlorate, the Cs(+)Br(ClO4)2(-) salt, was discovered and its structure was established by vibrational spectroscopy. A new and improved synthesis of anhydrous metal perchlorates was discovered. Investigation of synthetic methods for the preparation of the Rocketdyne discovered fluorocarbon perchlorates was continued. Work on the low-temperature ozonization of positive halogen compounds was completed. Numerous structural studies either have been completed or are under progress. The compounds studied include SF5Br, SF4, SF4O, ClF3O, CF3O(-), NF3O, and NF4(+) salts. (Modified author abstract)

PATENT-3 757 412 Not available NTIS
Department of the Air Force Washington D C
LANTHANIDE ISOPROPOXIDES AND PREPARATION OF SAME.
Patent,
Khodabakhsh Mazdiyasni, Leanne M. Brown, and Charles T. Lynch. Filed 20 Oct 71, patented 11 Sep 73, 4p Rept nos. PAT-APPL-191 127,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Rare earth compounds, Mercury compounds, Catalysts, Synthesis(Chemistry), Rare earth elements.
Identifiers: PAT-CL-260-429-2, *Isopropyl compounds, Isopropyl alcohols, Mercury halides, *Alcoholates.

The patent describes a process for preparing alkoxides of the lanthanide elements, in high yields and at increased reaction rates. Elements such as lanthanum, cerium, praseodymium and neodymium are reacted with isopropyl alcohol in the presence of a catalytic amount of mercuric iodide or a mixture of mercuric chloride and mercuric acetate.

7C. Organic Chemistry

AD-774 815/5GA PC$3.25/MF$1.45
Edgewood Arsenal Aberdeen Proving Ground Md
THE ANALYSIS OF SMOKE DYES. II. THE DETERMINATION OF 1-AMINO-4-HYDROXYANTHRAQUINONE IN 1,4-DIAMINOANTHRAQUINONE.
Technical rept. Jun 71-Jan 72,
Albert Deiner, and Charles Polley. Feb 74, 28p Rept no. ED-TR-73033

Descriptors: *Dyes, Chemical analysis, Molecular structure, Impurities, Thin layer chromatography, Infrared spectra, Visible spectra.
Identifiers: *Anthraquinones, Anthraquinone/1-amino-4-hydroxy, Anthraquinone/1-4-diamino-2-3-dihydro.

Leuco 1-amino-4-hydroxyanthraquinone has been identified as an impurity in 1,4-diamino-2,3-dihydroanthraquinone. Identification of this impurity was made by visible and infrared spectroscopy and thin-layer chromatography. The amount of the impurity 1-amino-4-hydroxyanthraquinone can be quantitatively determined in the presence of 1,4-diaminoanthraquinone by converting the 1-amino-4-hydroxyanthraquinone to the anion by reaction with 0.03M KOH in ethanol. Anion formation is accompanied by a bathochromic shift in the visible region to 603 nm. (Modified author abstract)

AD-774 819/7GA PC$3.00/MF$1.45
Edgewood Arsenal Aberdeen Proving Ground Md
THE DIRECT FLUORINATION OF POLYETHYLENE.
Technical rept. Jan-Dec 72,
Dennis L. Williams. Feb 74, 17p Rept no. EC-TR-73034

Descriptors: *Polyethylene, *Fluorination, Thermal stability, Fluorine, Stability, Chemical properties, Infrared spectra.
Identifiers: Gas surface interactions.

A convenient method has been found for the conversion of a polyethylene surface to a correspond-

ing fluoro analog. The process involves the direct, uncatalyzed reaction of gaseous fluorine with the polymer surface. The resultant surface displays many properties attributable to completely fluorinated polymers such as Teflon. These properties include solvent resistance, thermal stability, and chemical inertness. (Author)

AD-774 839/5GA PC$3.00/MF$1.45
Army Natick Labs Mass Clothing and Personal Life Support Equipment Lab
PREPARATION OF DIMETHYLSILYLENE-BISBENZOXAZOLES.
Technical rept.,
John H. Cornell, and David Remy. Oct 73, 25p
Rept no. C/PLSEL-110 USA-NLABS-73-49-CE

Descriptors: *Silanes, Synthesis(Chemistry), Thermal stability, Heat resistant plastics.
Identifiers: *Benzoxazoles.

Organic derivatives and precursors of the novel bisbenzoxazole dimethylsilanes were prepared as model compounds for projected thermally stable polymers containing this moiety. 5,5'-Dimethylsilylenebis(2-phenylbenzoxazole) and the 2-methyl analog are very thermally stable. (Modified author abstract)

AD-774 939/3GA PC$3.00/MF$1.45
Stevens Inst of Tech Hoboken N J Dept of Chemistry and Chemical Engineering
NON-LINEAR PHYSICS OF POLYMERS.
Final rept. Sep 67-Sep 73,
Angelo A. Volpe. Jan 74, 22p
Contract N00014-68-A-0131
See also AD-750 000.

Descriptors: *Polymers, Molecular structure, Mechanical properties, Metalorganic compounds, Polymerization, Catalysis, Reaction kinetics, Oxidation, Scientific research, Thermomechanics.
Identifiers: Themis project.

The Final Report contains a few general comments along with brief summaries of the various projects concerning polymers and polymerization which the co-principal investigators worked on during the seven-year existence of Project Themis. Also presented is a list of publications and technical reports which were completed during the period. (Modified author abstract)

AD-775 100/1GA PC$4.00/MF$1.45
Cornell Univ Ithaca N Y Dept of Chemistry
THE HOMOGENEOUS PYROLYSIS OF 2-BUTENES,
Peter Jeffers, and Simon H. Bauer. Jan 74, 19p
AFOSR-TR-74-0197
Contract AF-49(638)-1448
Prepared in cooperation with State Univ. of New York, Cortland.

Descriptors: *Pyrolysis, *Hydrocarbons, Methane, Propenes, Butadienes, Isomeric transitions, Catalysis, Shock tubes, Reaction kinetics.
Identifiers: *Butene/2.

The homogeneous pyrolysis of 2-butene subjected to shock heating was studied in the limit of high pressures by a relative rate technique. Over the temperature range 1150K-1325K, nearly equal amounts of methane, propylene, and butadiene were formed (with very little hydrogen) starting with either the cis-or trans-2-butene, while isomerization remained far from equilibrium. The results are consistent with a simple free radical mechanism. (Modified author abstract)

AD-775 532/5GA PC$3.00/MF$1.45
California Univ Los Angeles Dept of Chemistry
SYNTHESIS OF CLOSO-1,7-B10C2H12 FROM NIDO-2-B5CH9.
Interim rept.,
Richard R. Rietz, and M. Frederick Hawthorne. 11 Feb 74, 9p Rept nos. Contrib-3177, TR-38
Contract N00014-69-A-0200-4019

Descriptors: *Carboranes, *Pyrolysis, Synthesis(Chemistry).
Identifiers: Chemical reaction mechanisms, Carbahexaborane(9)/nido, Carbahexaborane(8)/methyl-nido, Dicarbadodecaborane(12)/closo.

The pyrolysis of 2-B5CH9 produced the higher carborane species 1,7-B6C2H8, 1, 7-B10C2H12 and 1, 3-B7C2H13. Pyrolysis of 3-CH3-B5CH8 produced B-methylated 1,6-B8C2H8(CH3)2. Possible mechanisms of this reaction are discussed. (Modified author abstract)

AD-775 535/8GA PC$3.00/MF$1.45
Princeton Univ N J Dept of Chemical Engineering
SYNTHETICS OF NOVEL POLYMERS WITH UNUSUAL PROPERTIES BY RADICAL POLYMERIZATION.
Final rept. 1 Jan-30 Jun 73,
Garth L. Wilkes. 20 Feb 74, 11p AROD-10987.1-C
Grant DA-ARO-D-31-124-73-G27

Descriptors: *Copolymerization, *Vinyl plastics, *Polyester plastics, *Polymethyl methacrylate, Synthesis(Chemistry), Polymerization.
Identifiers: Copolymers.

The synthesis and characterization of polyester-polyvinyl copolymers and the preparation and physical properties of polyester-polymethyl methacrylate block copolymers are briefly summarized. (Author)

N74-14862/8GA PC$3.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
FINDING THE MOST CONSISTENT MOLECULAR WEIGHT BY ANALYSIS OF THE AMINO ACIDS OF A PROTEIN.
M. Delange. Jan 74, 7p NASA-TT-F-15274
Contract NASW-2481
Tran-Transl. Into English from Biochim. Biophys. Acta (Amsterdam), No. 168, 1968 p 573-575.

Descriptors: *Amino acids, *Molecular weight, *Proteins, Chemical composition, Computer programming, Errors.

For abstract, see STAR 1206

N74-14864/4GA PC$3.00/MF$1.45
Hughes Aircraft Co., Culver City, Calif.
SYNTHESIS OF TEREPHTHALONITRILE N,N-DIOXIDE.
Final Report.
K. E. Vanburen. Dec 73, 13p NASA-CR-114705
Contract NAS2-7831

Descriptors: *Chemical reactions, Chemical engineering, Chlorination, Polymerization, Thermal stability.

For abstract, see STAR 1206

PAT-APPL-306 770 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
NON-AQUEOUS PROCESS FOR REACTING SULTONES WITH CELLULOSIC MATERIALS.
Patent Application,
Truman L. Ward, Ruth R. Benerito, and Ralph J. Berni. Filed 15 Nov 72, 9p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Cellulose, *Cotton fabrics, *Textile processes, Sulfur organic compounds, Chemical reactions.
Identifiers: PAT-CL-008-116-200, Sultones.

This invention relates to non-aqueous reactions of cellulose with hydrocarbon sultones. More specifically, this invention relates to reaction of celluloses by known methods to prepare the sodium cellulosate which in turn is reacted with a selected sultone in the absence of water and without the assistance of catalysts. The resultant sultone-celluloses are useful as ion-exchange agents or where active acidic sites are required for further reactions of the cellulosic materials.

PAT-APPL-311 609 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
D,D'-BIS-(PHOSPHONO) DICARBOXYLIC ACID DERIVATIVES.
Patent Application,
Jerry P. Moreau, Leon H. Chance, Gordon J. Boudreaux, and George L. Drake, Jr. Filed 4 Dec 72, 15p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Textile finishing, *Phosphonates, *Wrinkling, Synthesis(Chemistry).
Identifiers: Adipamides, PAT-CL-360-932-000.

This invention relates to dicarboxylic acid derivatives which contain a phosphono group in the alpha and alpha' positions. These have never been prepared by the Michaelis-Arbuzov reaction of the alpha,alpha'-dibromo dicarboxylic acid or its derivatives. These compounds have a wide variety of uses, of which of special interest is in textile applications wherein these serve as intermediates. Of the new compounds, the methylol derivatives of alpha,alpha'-bis(diethylphosphono)adipamide is specifically useful for imparting wrinkle resistance and flame retardance to cellulosic fabrics when used alone or in combination with a resin.

PAT-APPL-329 509 PC$4.25/MF$1.45
Department of the Air Force Washington D C
VINYL-SUBSTITUTED SILOXANE AND SILOXAZANE POLYMERS.
Patent Application,
Lawrence W. Breed. Filed 5 Feb 73, 21p Rept no.

Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Condensation reactions, *Elastomers, *Silicones, *Vinyl plastics, Nitrogen heterocyclic compounds, Crosslinking(Chemistry), Peroxides, Heat resistant materials, Patents, Curing, Thermal stability, Plastic coatings.
Identifiers: PAT-CL-260-46-5, *Patent applications.

In the patent polymer compositions are prepared by the polycondensation of an arylenedisilanol, a cyclic siloxazane compound or an N,N'-aminosilyl derivative thereof, and a vinyl-substituted arylenedisilanol. The polymer products are elastomeric and can be readily cured with conventional peroxide curing agents. Furthermore, the rubbery polymers exhibit a high degree of thermal stability and possess outstanding physical properties. The products can be formed into films, thereby rendering them particularly useful as protective coatings.

PATENT-3 305 567 Not available NTIS
Department of the Interior, Washington, D.C.
NITRATED FATTY ACID ESTERS.
Patent,
Clifford R. Houle, and Donald C. Malins. Filed 22 Jul 63, patented 21 Feb 67, 3p PAT-APPL-296 869,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Aliphatic acid esters, *Nitration, *Patents.
Identifiers: PAT-CL-260-404-5.

This invention relates to nitration ofjunsaturated fatty acids and derivatives thereof. It is an object of the present invention to provide a method for introducing nitrogen into the hydrocarbon chain of unsaturated fatty acids or derivatives thereof. It is a further objective to provide such a process which uses a mild, effective, and easy-to-prepare nitrating reagent.

PATENT-3 676 056 Not available NTIS
Department of Agriculture, Washington, D.C.
HIGH ENERGY RADIATION STABILIZATION OF CELLULOSE OBTAINED BY ESTERIFYING WITH THENOYL CHLORIDE.
Patent,
Jett C. Arthur, Jr., and Sujan Singh. Filed 30 Apr 71, patented 11 Jul 72, 3p PAT-APPL-139 138,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Radiation chemistry, *Esterification, *Cellulose, Glycosides.
Identifiers: PAT-CL-8-120, Thenoyl chloride.

This invention relates to a method for stabilizing organic materials that contain the glycosidic bond to the effects of high energy radiation. Stabilization is achieved by the introduction of thenoate groups as substituents into the said organic material. The method of this invention has as its objective the modification of the chemical structure of organic materials which contain the glycosidic bond to allow preferential transfer of high energy from one part of the organic material to the thenoate substituent group within which group radiation energy is dissipated without damage to the glycosidic bond of the organic material.

PATENT-3 677 692 Not available NTIS
Department of Agriculture, Washington, D.C.
HIGH ENERGY RADIATION STABILIZATION OF CELLULOSE OBTAINED BY ESTERIFYING WITH FUROYL CHLORIDE.
Patent,
Jett C. Arthur, Jr., Sujan Singh, and Oscar Hinojosa. Filed 30 Apr 71, patented 18 Jul 72, 3p PAT-APPL-139 137,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Radiation chemistry, *Esterification, *Cellulose, Glycosides.
Identifiers: PAT-CL-8-120, Furoyl chloride.

This invention relates to a method for stabilizing organic materials that contain the glycosidic bond to the effects of high energy radiation. Stabilization is achieved by the introduction of furoate groups as substituents into the said organic material. The method has as its objective the modification of the chemical structure of organic materials which contain the glycosidic bond to allow preferential transfer of high energy from one part of the organic material to the furoate substituent group within which group radiation energy is dissipated without damage to the glycosidic bond of the organic material.

PATENT-3 699 146 Not available NTIS
Department of Agriculture, Washington, D.C.
SYNTHESIS OF METHYL MALVALATE AND METHYL 5,6-METHANO-5-UNDECENOATE.
Patent,
Walter J. Gensler. Filed 31 Mar 70, patented 17 Oct 72, 10p PAT-APPL-24 338,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Aliphatic acid esters, Synthesis(Chemistry), Alkenes.
Identifiers: PAT-CL-260-464, *Malvalates, *Sterculates, Cyclopropenes.

Malvalic acid and its homologue, sterculic acid, together with two other closely related fatty acids are the only well-characterized naturally occurring cyclopropenes. Methyl sterculate has been synthesized. The present invention relates to syntheses of methyl malvalate as well as to the synthesis of a related cyclopropene, methyl 5,6-methano-5-undecenoate.

PATENT-3 702 232 Not available NTIS
Department of Agriculture, Washington, D.C.
TRIS(2-CHLOROETHYL)PHOSPHORAMIDE USED AS A CROSSLINKING AGENT FOR CELLULOSIC COMPOSITIONS.
Patent,
Earl J. Roberts, Mary Ann F. Brannan, and Stanley P. Roland. Filed 19 Nov 71, patented 7 Nov 72, 3p PAT-APPL-200 583,
Previously filed as PAT-APPL-49 551, 24 Jun 70.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Textile finishing, Cotton fabrics, Chlorine aliphatic compounds, Synthesis(Chemistry), Phosphorus organic compounds.
Identifiers: *Phosphoric triamide/tris(Chloroethyl), PAT-CL-8-116-P.

This invention relates to the preparation of a polyfunctional phosphoramide compound and to the reaction of said compound with cotton cellulose. Specifically, it relates to the preparation of tris(2-chloroethyl) phosphoramide (CPA) from the reaction of ethyleneimine with phosphorus oxychloride. This compound is useful in imparting a suitable degree ow wrinkle resistance to cotton fabrics. The reaction with cotton fabrics is carried out in a water/dioxane solution using common pad-dry-cure technique. Water-washing does not remove the reacted material from the treated cotton textiles.

PATENT-3 702 326 Not available NTIS
Department of the Air Force Washington D C
FUSED RING TETRAAMINO COMPOUND, THE TETRATOSYLATE THEREOF, AND THEIR SYNTHESIS.
Patent,
Fred E. Arnold. Filed 5 Aug 70, patented 7 Nov 72, 4p Rept nos. PAT-APPL-61 398,
Previously filed as PAT-APPL-816 839, 16 Apr 69.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Heat resistant plastics, *Polycyclic compounds, Synthesis(Chemistry), Thermal stability, Condensation reactions, Nitrogen heterocyclic compounds.
Identifiers: PAT-CL-260-250-R, *Pyrenes, Tosylates, Polybasic organic acids.

This invention comprises new thermally stable polymeric compositions, starting compounds and intermediates and methods for preparing the same. The polymers are prepared by the condensation of an aromatic tetraacid, such as 1,4,5,8-naphthalene tetracarboxylic acid, and a tetraamino fused ring compound, namely 2,3,11,12-tetraamino-diquinoxal(2,3-e, 2',3'-1)pyrene. This fused ring tetraamino compound is prepared from the 1,2-ditosylate of 1,2,4,5-tetraaminobenzene and 1,2,6,7-tetraketopyrene. With appropriate tetraacids or their derivatives and with sufficient reaction of the reagents, ladder polymers can be formed.

PATENT-3 702 857 Not available NTIS
Department of Agriculture, Washington, D.C.
DECOLORIZATION OF COTTONSEED OIL WITH FERRIC CHLORIDE.
Patent,
Lawrence Y. Yatsu, Thomas J. Jacks, and Thomas P. Hensarling. Filed 10 Mar 70, patented 14 Nov 72, 4p PAT-APPL-18 143,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Vegetable oils, *Cottonseed oil, *Decoloring, *Gossypol, Reclamation, Iron chlorides.
Identifiers: PAT-CL-260-426.

The invention relates to a process for removing color bodies from vegetable oil, specifically color bodies which are polyphenolic in nature. The example given covers the removal of gossypol and its products from cottonseed miscella. This is to provide for a method which will enable the salvaging of cottonseed oil which is currently considered 'fixed' with coloration and unsalvageable.

PATENT-3 704 257 Not available NTIS
Department of Agriculture, Washington, D.C.
N-CYCLOHEXYL-N-(2-CYANOETHYL) OLEAMIDE AS A PLASTICIZER.
Patent,
Robert R. Mod. Frank C. Magne, and Evaid L. Skau. Filed 13 Nov 69, patented 28 Nov 72, 8p PAT-APPL-876 554,
Previously filed as PAT-APPL-529 652, 24 Feb 66.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Plasticizers, Synthesis(Chemistry), Polyvinyl chloride.
Identifiers: PAT-CL-260-404-5, *Oleamide/N-cyanoethyl - N -cyclohexyl.

The invention provides N - cyclohexyl - N - (2 - cyanoethyl)oleamide as a plasticizer for vinyl chloride resins.

PATENT-3 706 762 Not available NTIS
Department of Agriculture, Washington, D.C.
FUNGICIDAL METHOD.
Patent,
Hiroshi Takeda, Walter H. Schuller, Ray V. Lawrence, and Seymour S. Block. Filed 7 May 71, patented 19 Dec 72, 5p PAT-APPL-141 422,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Fungicides, Ozonization, Carboxylic acids.
Identifiers: PAT-CL-424-308, Levopimaric acid.

This invention relates to the preparation of a new composition of matter which is active as a fungicide. This product is made by heating at about 200C., methyllevopimarate or a salt of levopimaric acid in the presence of a proton acceptor such as potassium hydroxide, sodium hydroxide, tris-n-butylamine, etc., and the product cleaved by ozonolysis and subsequently oxidized with chlorine.

PATENT-3 708 450 Not available NTIS
Department of Agriculture, Washington, D.C.
ELASTOMERIC POLYESTER-DERIVED POLYURETHANES CONTAINING 12-HYDROXYMETHYL-TETRAHYDROABIETANOL.
Patent,
John B. Lewis, and Glen W. Hedrick. Filed 16 Dec 71, patented 2 Jan 73, 5p PAT-APPL-208 935,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Polyurethane resins, *Patents, Elastomers, Additives, Crosslinking, Isocyanates, Gums.
Identifiers: Toluene diisocyanate, PAT-CL-260-26.

In the present invention, polyurethanes from toluene diisocyanate (TDI) and a mixture of poly (ethylene adipate) glycol (mol. wt., 2000) and butanediol were soft and weak with an average hydroxyl equivalent of the glycol mixture of about 250. An incorporation of 5 percent of the resinyl material in the formulation had a marked increase in the tensile properties. Additional increases of 10, 15, and 20 percent resulted in films having increased strength and stiffness and at 25 percent the hot polymer mixture was too viscous to handle and was hard and brittle cold.

PATENT-3 714 144 Not available NTIS
Department of Agriculture, Washington, D.C.

PROCESS FOR THE PRODUCTION OF SUCROCIDESTERS OF FATTY ADICS.
Patent,
Reuben O. Feuge, Hampden J. Zeringue, Jr., and Theodore J. Weiss. Filed 29 May 69, patented 30 Jan 73, 6p PAT-APPL-829 131,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Aliphatic acid esters, *Soaps, Synthesis(Chemistry).
Identifiers: PAT-CL-260-234-R.

This invention relates to the production of sucrose esters of fatty acids which acids contain from 2 to 22 carbon atoms. More specifically, it relates to a process for making mono-, di-, and higher esters of sucrose and the said fatty acids by interesterifying melted sucrose with various esters of the said fatty acids in the presence of soap or soap mixtures which soap or soap mixtures enhance the mutual solubility of the reactants and function as interesterification catalysts. It is also an object of the present invention to provide a novel and economical process for producing fatty acid esters of sucrose containing relatively large proportions of monoesters which compositions are useful as surface active agents.

PATENT-3 716 540 Not available NTIS
Department of Agriculture, Washington, D.C.
HEXACHLOROPENTADIENE ADDUCTS OF UNSATURATED PIPERAZINE AMIDES.
Patent,
Robert R. Mod, Frank C. Magne, and Evald L. Skau. Filed 16 Dec 71, patented 13 Feb 73, 7p PAT-APPL-208 953,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Germicides, *Plasticizers, *Piperazines, Synthesis(Chemistry), Amides, Chlorine aliphatic compounds, Cyclopentadiene compounds.
Identifiers: PAT-CL-260-268-00C.

This invention relates to certain new nitrogen-containing compounds, more particularly to N-substituted and N,N-disubstituted piperazine amides, the acyl moieties of which are the acyl moieties of the hexachlorocyclopentadiene adducts of either 9-octadecenoic or 10-undecenoic acids. These compunds are characterized by the fact that as growth inhibitors they are effective against a variety of bacteria, yeasts, and molds, some of which are pathogenic. They are also useful as placticizers.

PATENT-3 719 448 Not available NTIS
Department of Agriculture, Washington, D.C.
ORGANO-PHOSPHORUS COMPOUNDS CONTAINING PERFLUOROALKYL RADICALS AND THEIR APPLICATION TO CELLULOSIC TEXTILES.
Patent,
Leon H. Chance, and Jerry P. Moreau. Filed 9 Jun 71, patented 6 Mar 73, 7p PAT-APPL-151 556,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Iodine aliphatic compounds, *Iodination, Phosphonates, Synthesis(Chemistry).
Identifiers: PAT-CL-8-116-P.

The patent discusses a process in which perfluoroalkyl iodide monomer and telomer ester adducts of diethyl vinylphosphonate were prepared by free radical addition. Iodine of these adducts was replaced by hydrogen, and derivatives of the reduced phosphonate adducts were prepared, which include phosphonic acids, acid chlorides, and aziridinyl phosphine oxides. The aziridinyl phosphine oxides are used to impart oil and water repellency to cellulosic textiles. The other derivatives are useful as chemical intermediates as well as potential forming agents.

PATENT-3 732 179 Not available NTIS
Department of Agriculture, Washington, D.C.
PROCESS FOR PREPARING POLYURETHANES FROM HYDROXY-METHYLATED DERIVATIVES OF RESIN ACIDS.
Patent,
John B. Lewis, and Glen W. Hedrick. Filed 15 Mar 72, patented 8 May 73, 6p PAT-APPL-235 977,
Previously filed as PAT-APPL-36 672, 12 May 70.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Polyurethane resins, Additives, Isocyanates, Gums.
Identifiers: PAT-CL-260-24, Naval stores, Toluene diisocyanate.

The preparation of a new series of polyols derived from naval stores is described in the patent and their use in polyurethanes is demonstrated. Small amounts of these resin acid derivatives give added strength to polyurethane films prepared from propylene glycol polyethers and could very well be useful intermediates for industry. Increasing amounts of these new glycols blended with trimethylolpropane, 1,4-butanediol, and a polypropylene glycol and reacted with toluene diisocyanate (TDI) gave clear strong films with tensile strengths around 5000 p.s.i. Further addition resulted in harder, more brittle films.

PATENT-3 737 453 Not available NTIS
Department of Agriculture, Washington, D.C.
2-AMINOETHANOL SALT OF DEHYDROABIETIC ACID.
Patent,
Noah J. Halbrook, and Ray V. Lawrence. Filed 2 Dec 70, patented 5 Jun 73, 5p PAT-APPL-94 556,
Previously filed as PAT-APPL-632 541, 13 Nov 67.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Rosin, Precipitation(Chemistry).
Identifiers: PAT-CL-260-501-17, *Podacarpa-7-13-dien-15-oic acid/isopropyl.

This invention relates to the separation of dehydroabietic acid from rosin, other rosin acids and rosin materials either present in rosin or formed in the disproportionation of rosin. More specifically, it deals with a method for disproportionating rosin, isolating about 80-90% of the dehydroabietic acid formed as the 2-aminoethanol salt and recovering a residue rich in a dihydroabietic acid. Dehydroabietic acid is characterized by excellent stability to air oxidation. The acid and its derivatives are useful as intermediates in the preparation of other organic compounds for industrial application and therapeutic purposes.

PATENT-3 743 624 Not available NTIS
Department of the Air Force Washington D C
BENZOFUROISOQUINOLINE POLYMERS AND METHOD FOR SYNTHESIZING SAME.
Patent,
Albert J. Sicree, Fred E. Arnold, and Richard L. Van Deusen. Filed 6 Oct 72, patented 26 Jun 73, 5p Rept nos. PAT-APPL-295 787,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Heat resistant plastics, Polymerization, Furan resins, Benzimidazoles, Condensation reactions, Thermal stability, Synthesis(Chemistry), Nitrogen heterocyclic compounds.
Identifiers: PAT-CL-260-47-CP, *Polybenzimidazoles.

The patent describes the preparation of benzofuroisoquinoline ladder polymers by the condensation of 2,3,7,8-tetraaminodibenzofuran with an aromatic tetracarboxylic acid or a dianhydride thereof. The polymers possess a high degree of thermal stability, a property which renders them particularly suitable for use in high temperature applications such as in the fabrication of plastic composites, fibrous materials and protective coatings.

PATENT-3 746 731 Not available NTIS
Department of Agriculture, Washington, D.C.
PROCESS FOR REFINING GLYCERIDE OILS AND FATS.
Patent,
Esmond J. Keating. Filed 31 Dec 69, patented 17 Jul 73, 2p PAT-APPL-889 715,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Vegetable oils, Refining, Purification, Glycerides.
Identifiers: PAT-CL-260-426.

This invention relates to the purification of crude glyceride oils or fats usually with alkaline reagents for the purpose of clarifying and conditioning the oils or fats for various end uses, usually edible products. The process is commonly known as 'refining.'

PATENT-3 748 206 Not available NTIS
Department of the Air Force Washington D C
CURED POLYFERROCENYLENES AND PROCESS FOR CURING.
Patent,
Norman Bilow, and Harold Rosenberg. Filed 26 May 71, patented 24 Jul 73, 4p Rept nos. PAT-APPL-147 253,
Previously filed as PAT-APPL-805 008, 6 Mar 69.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Ferrocenes, *Copolymerization, *Heat resistant plastics, Aldehydes, Curing, Crosslinking(Chemistry), Catalyst, Radiation resistance, Curing agents.
Identifiers: *Polyferrocenes, PAT-CL-156-32F, Aromatic aldehydes.

Cured polyferrocenylenes and the process for curing them are disclosed in the patent. Low molecular weight thermoplastic polyferrocenylenes are reacted with aromatic dicarboxaldehydes. The resulting copolymers cross-link and cure to hard, heat-resistant, radiation-resistant structures upon treatment with heat and pressure.

PATENT-3 755 418 Not available NTIS
Department of Agriculture, Washington, D.C.
FINISHING AGENTS WITH REDUCED FORMAL-DEHYDE ODOR FOR CELLULOSE CONTAINING TEXTILE MATERIALS.
Patent,
Russell M. H. Kullman, John G. Frick, Jr., and Robert M. Reinhardt. Filed 18 Sep 70, patented 28 Aug 73, 4p PAT-APPL-73 629,
Previously filed as PAT-APPL-754 969, 23 Aug 68.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Textile finishing, *Wash wear treating, *Durable press treating, *Carbamates, Cotton fabrics, Crosslinking.
Identifiers: PAT-CL-260-482-C.

The finishing of cellulosic fabric to impart wash-wear and durable-press properties are usually practiced consists in the application and reaction of an agent on the fabric. It is believed that the agent reacts to form chemical bonds or crosslinks between long linear cellulose molecules. This invention consists of new finishing agents for the in-

troduction of wash-wear and durable-press properties into textiles. These new agents are characterized by noticeably reduced tendency to release formaldehyde fumes which property makes them particularly suitable for deferred-cure durable-press treatments and other treatments that have unreacted agent on the finished fabric. The new agents are prepared from the methylol carbamates previously used as finishing agents by treating them with an acetylating agent such as acetic anhydride. This treatment is believed to convert the methylol carbamates to acetoxymethyl carbamates, that is, the acetate ester of the methylol compound.

PATENT-3 756 779 Not available NTIS
Department of the Air Force Washington D C
SPECTRAL ANALYSIS OF KETOXIMES.
Patent,
Roger E. Rondeau, and B. Lawrence Fox. Filed 16 Nov 71, patented 4 Sep 73, 5p Rept nos. PAT-APPL-199 155,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Nuclear magnetic resonance, *Oximes, Stereochemistry, Spectrum analysis.
Identifiers: PAT-CL-23-230-R, Hydrogen chloride.

This invention relates to a process for determining the stereochemistry of ketoximes by nuclear magnetic resonance (NMR). Hydrogen chloride gas is added to a sample of a ketoxime in solution in an aromatic solvent after which the same is subjected to nuclear magnetic spectroscopy. The spectrum obtained makes it possible to determine whether the sample is a single ketoxime or a mixture of ketoxime isomers as well as whether a single ketoxime has a syn or anti form or the relative amount of the syn and anti forms in isomeric mixtures.

TT-72-51098 PC$3.00/MF$1.45
Agricultural Research Service, Washington, D.C.
CHANGE IN ACIDIC PROPERTIES OF SUGARS WITH TEMPERATURE (IZMENENIE KISLOTNYKH SVOISTV SAKHAROV S TEMPERATUROI),
V. Ya. Lygina, and E. S. Lygin. 1973, 8p
Trans. of Izvestiya Vysskikh Uchebnykh Zavadenii. Pishchevaya Tekhnologiya (USSR) n5 p34-36 1970. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Acidity, *pH, *Sugars, Sucrose, Glucose, Fructose, Temperature, Translations, USSR.

The main processes of sugar industry are carried out in aqueous solutions, hence the stability of sucrose in aqueous media is of utmost interest for industry. Potentiometric titration is the most convenient method of determination of ionization constants, paticularly at temperatures above 20C. By this method the authors determined the ionization constants of sucrose, glucose and fructose at different temperatures.

7D. Physical Chemistry

AD-774 768/6GA PC$3.25/MF$1.45
Colorado State Univ Fort Collins Dept of Chemistry
CHRONOCOULOMETRIC INVESTIGATION OF ADSORPTION IN MOLTEN NITRATES.
Technical rept.,
Edward E. Temmerman, and Robert A. Osteryoung. Feb 74, 34p Rept no. TR-2
Contract N00014-67-A-0299-0007

Descriptors: *Halides, *Adsorption, *Nitrates, *Fused salts, Chlorides, Bromides, Cadmium, Lead(Metal), Cadmium, Mercury, Cations.
Identifiers: Chronocoulometric analysis.

The adsorption of chloride, bromide, lead(II), and cadmium(II) on mercury in molten nitrates at 145 and 250C was investigated by double potential step chronoulometry. No adsorption was found for chloride, bromide, and for lead(II) and cadmium(II) in the presence of a large excess of chloride. An apparent adsorption of lead(II) and cadmium(II) was found in the presence of bromide. The results obtained suggest that this is due to the formation of an insoluble mercury-lead or cadmium-bromide compound. Qualitative experimental evidence for the existence of such a compound in molten nitrates was obtained. (Author)

AD-774 835/3GA PC$3.00/MF$1.45
Drexel Univ Philadelphia Pa
STUDIES OF ASC WHETLERITE REACTIVITY.
Quarterly rept. no. 1, 1 Jul-1 Oct 73,
Louis L. Pytlewski. Jan 74, 15p EC-CR-73010
Contract DAAA15-73-C-0263

Descriptors: *Carbon, *Copper compounds, *Absorbers(Materials), Chromates, Hydrolysis, Ammonium compounds, Infrared spectroscopy, Chemical reactions, Cyanogen, Cobalt compounds, Nitrates, Carbon dioxide.
Identifiers: *Whetlerite, *Cyanogen chloride, Cobalt nitrates, Copper ammonium chromates.

A vacuum system was constructed and connected directly to an infrared spectrophotometer so that reactant and product gases could be monitored as reactions proceed. The reactions studied involved cyanogen chloride gas, and solids as isolated from ASC Whetlerite solutions under a variety of experimental conditions in addition to ASC and other types of impregnated activated carbons. All of the hydrolysis and thermal decomposition products of ASC solutions have been isolated and characterized. The persistent yellow green type of copper chromate has been found to be isomorphous with brochantite, a basic copper sulphate mineral. The gaseous reaction products in all cases were either one or both of carbon dioxide and isocyanic acid. Molecular Sieves have been impregnated with dilute ASC solutions and some moderate degree of success obtained with cyanogen chloride uptake and reactivity. A chemical model with filter element is suggested using a mixture of brochantite-chromate; cobaltous nitrate hexahydrate; and a selective CO2 absorber. (Modified author abstract)

AD-774 852/8GA PC$5.75/MF$1.45
Purdue Univ Lafayette Ind Thermophysical Properties Research Center
THERMOPHYSICAL AND ELECTRONIC PROPERTIES INFORMATION ANALYSIS CENTER (TEPIAC): A CONTINUING SYSTEMATIC PROGRAM ON TABLES OF THERMOPHYSICAL AND ELECTRONIC PROPERTIES OF MATERIALS.
Final rept. 1 Oct 72-7 Oct 73,
Cho-Yen Ho. Jan 74, 207p* AMMRC-CTR-74-4
Contract DSA900-73-C-2101

Descriptors: *Thermophysical properties, *Technical information centers, *Information processing, Information retrieval, Optical properties, Magnetic properties, Electrical properties, Temperature, Thermochemistry.
Identifiers: Thermochemical properties.

The Final Report describes the activities and accomplishments of the Thermophysical and Electronic Properties Information Analysis Center (TEPIAC), which comprises internally the Thermophysical Properties Information Analysis Center (TPIAC) and the Electronic Properties Information Center (EPIC). TEPIAC's activities reported herein include literature search, acquisition, review, and codification; substance classification and organization; operation of a computerized information storage and retrieval system; publication of the Thermophysical Properties Research Literature Retrieval Guide Supplement; data extraction and compilation; data evaluation, correlation, analysis, synthesis, and generation of recommended reference values; publication of the TPRC Data Series, state-of-the-art summaries, and critical reviews; technical and bibliographic inquiry services; and current awareness and promotion efforts. TPIAC covers 14 thermophysical properties of all matter at all temperatures. EPIC covers 22 electronic (including also electrical, magnetic, and optical) properties and property groups of selected material groups at all temperatures. (Modified author abstract)

AD-774 859/3GA PC$3.00/MF$1.45
Explosives Research and Development Establishment Waltham Abbey (England)
A TITRATOR WITH AUTOMATIC END-POINT DETECTION FOR WATER DETERMINATIONS BY KARL FISCHER REAGENT.
Technical note,
R. Durrant. Apr 73, 16p Rept no. ERDE-TN-90
DRIC-BR-36273

Descriptors: *Volumetric analysis, Laboratory equipment, Water, Liquid propellants, Solid propellants, Chemicals, Experimental design, Sensitivity, Great Britain.
Identifiers: *Moisture content.

A semi-automatic titrator is described capable of determining concentrations of water of less than 0.1 per cent in both liquid and solid samples. The apparatus has been designed to eliminate or reduce factors having an effect on end-point stability so that a reproducible amperometric end-point is obtained. Some typical results for liquid and solid samples are included. (Author)

AD-774 900/5GA PC$3.75/MF$1.45
Naval Ordnance Lab White Oak Md
ABSORPTION OF CO LASER RADIATION BY WATER VAPOR NEAR 5 MICROMETERS.
Technical rept.,
E. L. Harris, and W. J. Glowacki. 26 Nov 73, 59p
Rept no. NOLTR-73-206

Descriptors: *Water vapor, *Absorption spectra, Coefficients, Carbon monoxide lasers, Infrared spectra, Absorption(Physical), Spectrum analysis, Shape, Spectral lines, Atmospheres.
Identifiers: Absorptivity, *Atmospheric attenuation.

Calculations of the absorption of CO laser radiation by water vapor are brought into good agreement with the experimental data by modifying the Lorentz line shape formula. Results of absorption and transmittance calculations made using the modified line shape formula are presented for CO laser lines and other wavelengths near 5 micrometers at various water vapor partial pressures. (Modified author abstract)

AD-774 942/7GA PC$8.75/MF$1.45
Boeing Aerospace Co Kent Wash Laser Physics Lab
MIXING AND REACTION IN HIGH SPEED H2-F2-DILUENT FLOWS FOR USE WITH SUPERSONIC PULSED HF LASERS.
William J. Thayer, III, and J. Doyle McClure. Aug 73, 113p Rept no. D180-17608-1
Contract N60921-72-C-0356

Descriptors: *Chemical lasers, *Supersonic flow, *Mixing, Chain reactions, Hydrogen, Fluorine, Gas flow, Mathematical models, Turbulence.
Identifiers: *Hydrogen fluoride lasers, Pulsed lasers.

Rationale for supersonic pulsed chemical lasers and problem areas related to design and use of associated reagent premixers are described. An analytical model of reagent mixing and reaction for evaluation of 'prereaction' and mixing characteristics of high enthalpy H2-F2-diluent flows is formulated and programmed for computer solution. The code is used to evaluate parametric dependence of prereaction level and required mixing

length on principal parameters defining candidate premixer flows. Possible flow choking and subsequent detonation in the mixing region resulting from reacting flow transients following a fast laser-reaction pulse are examined, both by defining conditions under which choking by chemical heat addition and/or Chapman-Jouguet detonations are energetically allowed, and by using a simplified reacting flow model to estimate kinetic limitations on probable occurrence of such disturbances. (Modified author abstract)

AD-774 943/5GA PC$3.00/MF$1.45
Intelcom Rad Tech San Diego Calif
MOLECULAR BEAM STUDIES OF ATOMIC COLLISIONS.
Final rept. 1 Sep 69-31 Dec 73,
R. H. Neynaber. 28 Feb 74, 15p Rept no. RT-8007-004
Contract N00014-70-C-0037

Descriptors: *Molecular beams, *Nitrogen, *Oxygen, *Barium, Nitrogen oxides, Scientific research, Cross sections, Ions, Atoms, Molecules, Energy transfer, Gas ionization, Helium, Hydrogen, Particle collisions.
Identifiers: *Ion molecule interactions, *Atom molecule interactions.

A summary of the research performed over the period 1 September 1969 - 31 December 1973 is presented. Most of the work consisted of studies of ion-molecule reactions by merging-beams techniques. Species involved included Ba, O, N2, O2(+), NO(+), N2(+), N(+), and O(+). In addition, a study was made of associative ionization in collisions of He(*) with H2. (Modified author abstract)

AD-774 982/3GA Reprint
Army Materials and Mechanics Research Center Watertown Mass
EFFECT OF OXYGEN IMPURITIES ON THE NITRIDATION OF HIGH-PURITY SILICON,
Donald R. Messier, Philip Wong, and Athlea E. Ingram. 20 Nov 72, 6p Rept no. AMMRC-TR-74-4
Revision of report dated 14 Oct 72.
Availability: Pub. in Jnl. of the American Ceramic Society, v56 n3 p171-172 Mar 73.

Descriptors: *Silicon, *Nitration, *Silicon nitrides, Oxygen, Impurities, Reaction kinetics.

It is shown that oxygen impurities at levels considerably <10 ppm can significantly retard the rate of nitridation of silicon powder compacts. Outgassing and the use of a suitable getter enhance the rate of nitridation. (Author)

AD-775 002/9GA PC$3.25/MF$1.45
Illinois Univ Urbana Dept of Chemistry
CHEMICAL ASPECTS OF NUCLEAR MAGNETIC RESONANCE.
Technical rept.,
H. S. Gutowsky. 25 Feb 74, 32p Rept no. TR-4
Contract N00014-67-A-0305-0023
Presented at the Proceedings of the International Symposium on Magnetic Resonance (5th), 25 Feb 74.

Descriptors: *Nuclear magnetic resonance, Amides, Molecular spectroscopy, Spectrum analysis, Coupling(Interaction), History.
Identifiers: Nuclear magnetic resonance(Fluorine 19).

An unexpurgated historical synopsis is given of the author's role in the early applications of nmr to chemical problems, with emphasis upon the importance of chance, serendipity, ignorance and faculty clubs. Several research areas are discussed, including the broad line-shapes in solids and their motional narrowing, fluorine and proton chemical shifts, multiplets in liquids, chemical exchange, and an unsuccessful search for the ear of conduction electrons. A brief account is given of some current work in which chemical exchange rates are being determined from the dependence upon resonance frequency of the coalescence temperature for several N,N-dimethylamides. (Author)

AD-775 033/4GA Not available NTIS
National Research Council of Canada Ottawa (Ontario) Div of Physics
THE VIBRATIONAL FREQUENCIES OF HNO,
F. N. Clough, B. A. Thrush, D. A. Ramsay, and J. G. Stamper. 29 Aug 73, 2p
Availability: Pub. in the Chemical Physics Letters, v23 n2 p155-156, 15 Nov 73.

Descriptors: *Infrared spectra, Spectrum analysis, Canada, Molecular vibration, Emission spectra, Chemical reactions.
Identifiers: *Hyponitrous acid.

Electronic and vibrational emission spectra have been produced by the reaction of H atoms with NO, and studied under moderate resolving power. Bands are assigned. (Modified author abstract)

AD-775 055/7GA PC$8.00/MF$1.45
Bell Aerospace Co Buffalo N Y
HIGH SPEED TURBULENT MIXING AND COMBUSTION.
Progress rept.,
J. H. Morgenthaler, and G. Rudinger. Nov 73, 100p Rept no. BAC-9500-920316 AFOSR-TR-74-0228
Contract F44620-70-C-0116

Descriptors: *Turbulent flow, *Mixing, *Combustion, Turbulence, Gas flow, Ignition lag, Chemical lasers, Boron, Ignition, Flow rate, Burning rate, Mathematical models, Jet propulsion, Jet flow.

Research results discussed are associated with investigations of turbulent mixing and combustion processes in advanced propulsion and laser systems. Momentum transport modeling for jets was completed. Review of analytical and experimental mixing literature was extended to chemical lasers. A unique analytical modeling approach applicable to practical hardware such as chemical lasers and sudden dump combustors is presented. A correlation was obtained for jet penetration of light and heavy gases injected into a subsonic cross flow through a narrow slot. Feasibility of obtaining combustion data for small boron particles near atmospheric pressure using shock-tube techniques was demonstrated, and ignition delay determined. (Modified author abstract)

AD-775 065/6GA Reprint
California Univ San Diego La Jolla Inst for Pure and Applied Physical Sciences
VELOCITY EFFECTS ON POLLUTANT DIAGNOSTICS WITH TUNABLE LASERS FOR DOPPLER-BROADENED LINES,
S. S. Penner, and H. K. Chen. 11 Apr 73, 11p
Contract DAHC04-72-C-0037
Availability: Pub. in Jnl. of Quantum Spectroscopy and Radiative Transfer, v13 p1315-1324 1973.

Descriptors: *Doppler effect, *Spectral lines, Molecular spectroscopy, Profiles, Gas flow, Tunable lasers, Gas analysis.
Identifiers: Air pollution detection.

The effect of velocity distortions in high-speed gas flows must be allowed for in diagnostic studies using tunable lasers. Presented are the results of theoretical studies on the distortion of a Doppler-line profile produced by directed motion in a conical source flow and results for an idealized flow with constant flow velocity and temperature in the observation plane. Results suggest that it will be very difficult to determine gas compositions from high-resolution spectroscopic observations (e.g. laser-absorption measurements) unless the velocity field is determined independently. Sensitivity losses in line-center and derivative spectroscopy may be estimated from data for representative flow conditions. (Modified author abstract)

AD-775 120/9GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
CALCULATION OF REAL GAS PROPERTIES FROM TABLES OF TRIGONOMETRIC FUNCTIONS,
K. A. Kairutdinov. 4 Feb 74, 14p Rept no. FTD-HT-23-922-74
Edited trans. of Inzhenerno-Fizicheskii Zhurnal (USSR) v24 n4 p735-739 Apr 73, by K. L. Dion.

Descriptors: *Thermodynamics, *Gases, Numerical analysis, Translations, USSR.

A series of numerical examples is used to show the possibilities of applying numerical differentiation methods to tables of thermodynamic functions.

AD-775 159/7GA PC$3.75/MF$1.45
Aerospace Corp El Segundo Calif Lab Operations
EINSTEIN COEFFICIENTS FOR DIATOMIC MOLECULES.
Rept. for 5 Jul 71-30 Jun 72,
John M. Herbelin, and George Emanuel. 30 Jan 74, 46p Rept no. TR-0074(4530)-5 SAMSO-TR-74-15
Contract F04701-73-C-0074

Descriptors: *Diatomic molecules, Potential energy, Mathematical models, Molecular vibration, Molecular energy levels, Deuterium compounds, Carbon monoxide.
Identifiers: Hydroxyl radical, *Transition probabilities, Einstein coefficients, Hydrogen fluoride, Hydrogen chloride, Nitrogen oxide(NO).

Reexamination of current semiempirical methods for computing Einstein coefficients for diatomic molecules has resulted in the development of a new technique for predicting infrared transition probabilities. The method uses a nonlinear transformation of existing polynomial dipole expressions with the subsequent application of appropriate boundary conditions to arrive at improved dipole curves. The transition probabilities predicted for HF are found to be in excellent agreement with the available experimental data. With slight variations, the method is applied to DF, HCl, DCl, OH, and OD with comparable success. Preliminary results are given for the transition probabilities for the CO and NO molecules. (Modified author abstract)

AD-775 167/0GA PC$3.25/MF$1.45
Aerospace Corp El Segundo Calif Lab Operations
TEMPERATURE DEPENDENCE OF THE QUENCHING OF VIBRATIONALLY EXCITED NITROGEN BY ATOMIC OXYGEN,
Robert J. McNeal, Milo E. Whitson, Jr., and Gilbert R. Cook. 5 Feb 74, 26p Rept no. TR-0074(9270-01)-4 SAMSO-TR-74-25
Contract F04701-73-C-0074

Descriptors: *Nitrogen, *Quenching(Inhibition), *Upper atmosphere, Atoms, Oxygen, Reaction kinetics, Molecular vibration, Energy transfer, Excitation, Molecular energy levels, Temperature.
Identifiers: Oxygen atoms, Atom molecule interactions.

A photoionization detector for vibrationally excited nitrogen has been used to obtain the rate of quenching by atomic oxygen in the temperature range of 300 to 723K. These measured coefficients together with higher temperature data obtained elsewhere with different experimental methods indicate that the VT process in the N2 - O system is anomalously efficient over the range of 300 to 4500K and has only a moderate temperature dependence. This result has important consequences in the upper atmosphere where the effect of an efficient VT process involving N2 and O is to hold the atmospheric N2 vibrational temperature at or very near the ambient kinetic temperature, which is in agreement with the results of recent rocket probe experiments. (Modified author abstract)

AD-775 173/8GA Reprint
Wayne State Univ Detroit Mich Dept of Chemistry
EFFECT OF PHOTOIONIZATION ENERGY ON THE DISTANCE DISTRIBUTION BETWEEN TRAPPED ELECTRONS AND N,N,N'N'-TETRAMETHYL-P-PHENYLENEDIAMINE CATIONS IN ORGANIC GLASSES,
Hermann Moeckel, Josephine Yuen, and Larry Kevan. 17 Aug 73, 5p AFOSR-TR-74-0256
Grant AF-AFOSR-1852-70, Contract AT(11-1)-2086
Availability: Pub. in Jnl. of Physical Chemistry, v77 n25 p3035-3036 1973.

Descriptors: *Fluorescence, *Recombination reactions, Ionization, Photochemical reactions, Electrons, Cryogenics, Excitation.
Identifiers: Matrix isolation techniques, *Phenylenediamines.

The recombinatorial luminescence from trapped electrons and N,N,N',N'-tetramethyl-p-phenylenediamine cation (TMPD+) in methyltetrahydrofuran and 3-methylpentane glasses at 77 K following photoionization of TMPD was studied. (Modified author abstract)

AD-775 174/6GA Reprint
Wayne State Univ Detroit Mich Dept of Chemistry
PROPERTIES OF TRAPPED AND MOBILE ELECTRONS IN PURE ICE AND IN ALKALINE ICE,
Larry Kevan. 1973, 8p AFOSR-TR-74-0255
Contract AF(11-1)-2086, Grant AF-AFOSR-1852-70
Availability: Pub. in Physics and Chemistry of Ice, p156-160 1973.

Descriptors: *Ice, *Radiolysis, *Electron mobility, Photoconductivity, Visible spectra, Gamma rays, Single crystals, Cryogenics, Band theory of solids, Electrons.
Identifiers: *Trapped electrons.

Electrons generated by gamma-irradiation are trapped with high efficiency in glassy alkaline ice and with low efficiency in single crystal ice at 77K. The trapped electrons are characterized by an optical absorption band in the visible, and photoexcitation produces photoconductivity and optical bleaching. The details of a nonuniform spatial distribution have been investigated by measurement of spin-spin interactions by paramagnetic relaxation methods. Matrix ENDOR measurements have given a value for a spatial extent of the ground state wavefunction in alkaline ice. The transport mechanism of the photoexcited electrons in the alkaline ice matrix have been investigated by measurement of both Hall and drift mobilities as a function of temperature and voltage. (Modified author abstract)

AD-775 183/7GA PC$3.75/MF$1.45
Windsor Univ (Ontario) Dept of Physics
QUENCHING IN COPPER.
Final rept. 1 Dec 72-30 Jun 73,
Lucjan Krause. Feb 74, 67p AFAL-TR-73-439
Contract F33615-73-C-1093

Descriptors: *Copper, *Quenching(Inhibition), Electron transitions, Fluorescence, Atomic energy levels, Metal vapors, Metastable state, Experimental design, Canada.
Identifiers: *Copper lasers, Metal vapor lasers, Transition probabilities.

The purpose of this research was to investigate the quenching of the 4 doublet D(3/2) - 4 doublet D(5/2) states of copper. These are the terminal states involved in the copper laser in which stimulated transitions take place from doublet P to doublet D states. The approach which was adopted involved the introduction into the copper discharge system similar to that employed in the actual laser, another atomic species with resonance states in the vicinity of the Cu states, to which excitation transfer from the doublet D states could easily take place. Such is the case with the resonance states of potassium and of cesium. The seven months over which the contract extended (December 1st 1972 to June 30th 1973) were spent in the design and construction of the experiment and in some preliminary tests of the apparatus and of the discharge. (Modified author abstract)

AD-775 185/2GA Reprint
Washington State Univ Pullman Dept of Chemistry
SYMMETRY ASSIGNMENTS OF THE LOWEST CT EXCITED STATES OF RUTHENIUM(II) COMPLEXES VIA A PROPOSED ELECTRONIC COUPLING MODEL,
R. W. Harrigan, and G. A. Crosby. 12 Apr 73, 12p AFOSR-TR-74-0235
Grant AF-AFOSR-1342-68
Availability: Pub. in The Jnl. of Chemical Physics, v59 n7 p3468-3476, 1 Oct 73.

Descriptors: *Ruthenium compounds, *Metal complexes, *Charge transfer, Relaxation time, Cryogenics, Luminescence, Spectrum analysis, Coupling(Interaction), Molecular energy levels, Electron transitions, Temperature.

Temperature dependence measurements of the decay times of the observed charge-transfer luminescence of three ruthenium(II) complexes indicate a manifold of decaying excited levels in thermal equilibrium. Relative energies and decay constants for each level have been derived from the data for the tris(2,2'-bipyridine)ruthenium(II) and tris(4,4'-diphenyl-2,2'-bipyridine)ruthenium(II) cations and for cis-dicyanobis(2,2'-bipyridine)ruthenium(II). An electronic coupling model has been proposed that satisfactorily rationalizes the experimental results and allows the levels to be symmetry labeled. (Author)

AD-775 187/8GA Reprint
La Plata Univ (Argentina) Instituto de Investigaciones Fisicoquimicas Teoricas Y Aplicades
DIE KINETIK DES THERMISCHEN F2O-ZERFALLES (THE KINETICS OF THE THERMAL DECOMPOSITION OF F2O),
J. Czarnowski, and H. J. Schumacher. 17 Nov 62, 22p AFOSR-TR-74-0253
Grant AF-AFOSR-1446-68
Text in German.
Availability: Pub. in the Zeitschrift fuer Physikalische Chemie Neue Folge, v86 p7-26 1973.

Descriptors: *Fluorine compounds, *Oxygen compounds, *Decomposition, Thermal degradation, Reaction kinetics, Argentina.
Identifiers: *Oxygen fluoride(OF2).

The reaction mechanisms and rate constants have been determined and are listed. Equations for the decomposition of F2O with and without inert gases are given. The relative efficiency coefficients of the different inert gases in the decomposition scheme are given. The chain length of the decomposition decreases with increasing F2O pressure and increase of temperature.

AD-775 263/7GA Reprint
Rosenstiel School of Marine and Atmospheric Science Miami Fla
VOLUME CHANGE OF ION PAIR FORMATION: RUBIDIUM NITRATE AND THALLIUM (I) NITRATE IN WATER,
William L. Masterton, Harry Welles, Jonathan H. Knox, and Frank J. Millero. 7 May 73, 13p Rept no. Contrib-1687
Contract Nonr-4008(02), Grant NSF-GA-17386
Prepared in cooperation with Connecticut Univ., Storrs. Dept. of Chemistry. Revision of report dated 16 Mar 73.
Availability: Pub. in Jnl. of Solution Chemistry, v3 n2 p91-102 1974.

Descriptors: *Nitrates, *Rubidium compounds, *Thallium compounds, *Metal complexes, *Electrostriction.
Identifiers: Density(Mass/volume).

Density data for dilute aqueous solutions of RbNO3 and TlNO3 at 25C lead to equations for the apparent molal volumes. The electrostriction volume effect is discussed. (Modified author abstract)

AD-775 273/6GA Reprint
Rosenstiel School of Marine and Atmospheric Science Miami Fla
APPARENT MOLAL VOLUMES OF AQUEOUS NAF, NA2SO4, KCL, K2SO4, MGCL2, AND MGSO4 SOLUTIONS AT 0 DEGREES AND 50 DEGREES C,
Frank J. Millero, and Jonathan H. Knox. 11 Jun 73, 5p Rept no. Contrib-1658
Contract N00014-67-A-0201-0013, Grant NSF-GA-17386
Revision of report dated 31 Jan 73.
Availability: Pub. in Jnl. of Chemical and Engineering Data, v18 n4 p407-411 Oct 73.

Descriptors: *Solutions(Mixtures), Density.
Identifiers: *Density(Mass/volume), Sodium fluorides, Sodium sulfates, Potassium chloride, Potassium sulfates, Magnesium chlorides, Magnesium sulfates.

The apparent molal volumes, of dilute (0.002-1m) aqueous solutions of NaF, Na2SO4, KCl, K2SO4, MgCl2, and MgSO4 are determined at 0 and 50C from precision density measurements made with a magnetic float densitometer. The infinite dilution apparent molal volumes, are determined by using the Redlich equation. The ion-ion and ion-water interactions responsible for the observed behavior are briefly discussed. (Modified author abstract)

AD-775 275/1GA Reprint
Rosenstiel School of Marine and Atmospheric Science Miami Fla
THE ENTHALPIES OF DILUTION OF AQUEOUS BORIC ACID SOLUTIONS AT SEVERAL TEMPERATURES,
Gary K. Ward, and Frank J. Millero. 14 Jan 73, 5p Rept no. Contrib-1621
Contract Nonr-4008(02), Grant NSF-GA-17386
Revision of report dated 4 Nov 72.
Availability: Pub. in Jnl. of Chemical Thermodynamics, v5 p591-594 1973.

Descriptors: *Boric acid, *Dilution, Enthalpy, Temperature.

The enthalpies of dilution of boric acid in the molality range 0.7 to 0.1 mol/kg have been measured at 283.15, 288.15, 303.15, and 323.15K. The enthalpy of dilution to infinite dilution of boric acid was found to vary linearly with molality. (Modified author abstract)

AD-775 328/8GA PC$4.00/MF$1.45
Cornell Univ Ithaca N Y Lab of Plasma Studies
RESEARCH ON MOLECULAR LASERS.
Annual rept. 1 Oct 72-30 Sep 73,
George J. Wolga, and Simon H. Bauer. Nov 73, 83p
Contract N00014-67-A-0077-0006, ARPA Order-660
See also AD-760 701.

Descriptors: *Chemical lasers, *Energy transfer, Carbon disulfide, Oxygen, Gas lasers, Carbon dioxide, Molecular vibration, Molecular energy levels, Temperature, Relaxation, Relaxation time, Reaction kinetics, Particle collisions.
Identifiers: Collisional energy transfer, Hydrogen fluoride.

Research concerning molecular and chemical lasers was conducted in the following areas: (1) Measurement of V-V and V-R,T rates among hydrogen halide molecules. (2) Vibrational relaxa-

tion studies of CO2(00.1). (3) a. Chemical laser studies of the reaction of atomic oxygen and acetylene system, b. Computer modeling the CS2-O2 chemical laser system, and the reaction of C3O2 with oxygen. (4) Experimental study of the relaxation of CO2(001) and HF(v = 1). (5) Studies of the influence of vibrational excitations on the reaction rate of atom exchange reactions. (Modified author abstract)

AD-775 332/0GA Reprint
Columbia Radiation Lab New York
INVESTIGATION OF THE INTERACTION POTENTIAL BETWEEN A NEUTRAL MOLECULE AND A CONDUCTING SURFACE,
A. Shih, D. Raskin, and P. Kusch. 18 Jul 73, 11p
Contract DAAB07-69-C-0383, Grant DA-ARO-D-31-124-G972
Availability: Pub. in Physical Review A, v9 n2 p652-662 Feb 74.

Descriptors: *Electrical conductivity, *Surfaces, Molecular beams, Potential energy, Experimental design, Molecules, Dipole moments.
Identifiers: *Gas surface interactions.

The interaction potential between a neutral molecule and a conducting surface is investigated through the study of the deflection of a beam of molecules by the conducting surface. A (1/(r cubed)) potential is predicted from a model in which the permanent dipole of the molecule interacts with its image in the surface of an ideal conductor. The measured deflection by the conducting surface does not agree precisely in form with this predicted potential. (Modified author abstract)

AD-775 342/9GA Reprint
Queen'S Univ Belfast (Northern Ireland) Dept of Applied Mathematics and Theoretical Physics
ON THE QUANTUM AND SEMI-CLASSICAL THEORIES OF A TWO-LEVEL ATOM INTERACTING WITH A SINGLE-FIELD MODE,
S. Swain. 12 Oct 73, 5p
Contract N00014-69-C-0035
Availability: Pub. in Jnl. of Physics, A: Proceedings of the Physical Society (General), v6 pL169-L173 Dec 73.

Descriptors: *Atoms, Approximation(Mathematics), Potential energy, Atomic energy levels, Electromagnetic fields, Quantum theory, Great Britain.
Identifiers: Quantum electrodynamics.

Formally exact solutions to the quantum and semi-classical models of a single atom interacting with a single-field mode in the dipole approximation are compared. (Modified author abstract)

AD-775 379/1GA PC$3.00/MF$1.45
Picatinny Arsenal Dover N J
A RAPID X-RAY DIFFRACTOMETER METHOD FOR MONITORING THE PURITY OF NH4CLO4.
Technical memo.,
Arthur J. Bracuti , and Joseph Campisi. Feb 74, 8p
Rept no. PA-TM-2124

Descriptors: *Ammonium perchlorate, *Purity, *X ray diffraction, Potassium compounds, Perchlorates, Crystal structure.
Identifiers: Potassium perchlorate, Lattice parameters.

The lattice parameters of six samples of NH4ClO4 and NH4ClO4/KclO4 solid solutions were determined by means of the wide angle X-ray diffractometer using fixed count techniques. This method of data retrieval using 1600 counts measured at 0.05 degrees 2 theta increments required about 10 minutes per reflection. The approximation method was employed for all calculations. The results indicated that this technique could be used to monitor the purity of NH4ClO4 with regard to KClO4 as solute in the NH4ClO4/KClO4 solid solution system. (Author)

AD-775 401/3GA PC$4.50/MF$1.45
Westinghouse Research Labs Pittsburgh Pa
STUDY OF PHASE EQUILIBRIA IN THE SYSTEMS TL-AS-S AND TL-AS-SE.
Final technical rept. 1 Jul 72-31 Dec 73,
G. W. Roland, J. D. Feichtner, and J. P. McHugh.
31 Dec 73, 112p AFML-TR-74-6
Contract F33615-72-C-1976, ARPA Order-2071

Descriptors: *Thallium, *Arsenic, *Sulfur, *Selenium, *Phase studies, Sulfides, Selenides, Crystal structure, Crystal growth, Optical properties, Acoustic properties, Acoustooptics.
Identifiers: Arsenic Thallium sulfides, Arsenic Thallium selenides.

The objective of this program was to determine the phase equilibria in the systems Tl-As-S and Tl-As-Se and a portion of the quaternary system Tl-As-S-Se so as to optimize crystal growth of compounds in these systems, notably Tl2AsS3, Tl3AsSe3, and Tl3AsS4. These compounds form promising nonlinear optical and acousto-optical crystals. Optical techniques were to be used to evaluate crystal quality and the optical properties of any new compounds encountered were to be investigated to determine their potential as useful optical materials.

AD-775 425/2GA PC$3.25/MF$1.45
Hebrew Univ., Jerusalem (Israel). Dept. of Inorganic and Analytical Chemistry.
ENERGY TRANSFER BETWEEN INORGANIC IONS IN GLASSES.
Final technical rept. 15 Nov 72-14 Nov 73,
Renata Reisfeld. Nov 73, 38p
Contract DAJA37-73-C-1581

Descriptors: *Rare earth elements, *Glass, *Lead(Metal), Electron transitions, Doping, Ions, Energy transfer, Absorption spectra, Emission spectra, Fluorescence, Phonons, Chemical bonds, Optical properties, Spectrum analysis, Atomic energy levels, Israel.
Identifiers: Transition probabilities, Ligand fields.

Inorganic glasses doped by rare earth (Gd(3+),Eu(3+),Sm(3+),Tb(3+),Tm(3+),Er(3+) and lead ions were prepared. Intensity parameters and probabilities of radiative electronic transitions were calculated from the experimentally obtained fluorescence and adsorption spectra. Nonradiative transition probabilities between various electronic levels were obtained from the quantum yields of the fluorescence and fluorescence life-times. A connection was found between the phonon energies of the glasses and the luminescence quantum yields of rare earth ions incorporated in these glasses. The amount of covalency between a given glass and a heavy metal ion was obtained from a study of optical characteristics of divalent lead in various glasses. A connection has been found between the nephelauxetic effect and electronegativity of the glasses. The probability of energy transfer between gadolinium and samarium was measured in borate glasses and the mechanism of transfer suggested. (Modified author abstract)

AD-775 432/8GA PC$3.00/MF$1.45
Cornell Univ Ithaca N Y
DETECTION, STUDY AND CHEMICAL REACTIVITY OF BORON INTERMEDIATES GENERATED BY HIGH TEMPERATURE AND PHOTOCHEMICAL PROCESSES.
Rept. no. 1 (Final), 1964-1973,
Richard F. Porter. 15 Feb 74, 13p AROD-4890.36-C
Contract DA-31-124-ARO(D)-320, Grant DA-ARO(D)-31-124-G554

Descriptors: *Boron compounds, Boranes, High temperature, Scientific research, Vibrational spectra, Photochemical reactions, Reaction kinetics, Thermochemistry, Boron, Ions.

A brief summary of research activity on high temperature and photochemical intermediates in boron chemistry is presented. The work has resulted in approximately 50 technical publications in boron chemistry. Vibrational spectra have been obtained for the intermediates BH3 (borane) HBO and HBNH which has been isolated in low temperature matrices. Techniques were used for deriving thermochemical data for ionized boron species in the vapor phase. (Modified author abstract)

AD-775 460/9GA PC$3.75/MF$1.45
Ballistic Research Labs Aberdeen Proving Ground Md
TRANSPORT COEFFICIENTS FOR MULTICOMPONENT, POLYATOMIC, REACTING GAS MIXTURES (THEORY AND COMPUTER CODE),
Rurik K. Loder. Feb 74, 74p Rept no. BRL-1699

Descriptors: *Gas dynamics, *Transport properties, Thermodynamics, Computer programs, Diffusion, Solid propellants.

As part of a systematic study of the ignition of solid propellants, a computer program was developed to compute the transport coefficients for a multicomponent, polyatomic, reacting gas system as functions of local temperature, pressure, density and molal concentrations as well as of molecular weights, enthalpies, specific heats, intermolecular potential-energy functions, and stochiometric coefficients for all chemical species present in the system. The formulae for the transport coefficients are based on Hischfelder's extension of the Chapman-Enskog kinetic theory to multicomponent, polyatomic reacting gas mixtures. Lennard-Jones and Stockmayer potentials are used for the intermolecular potential functions of the molecules in the mixture. (Author)

AD-775 465/8GA PC$5.00/MF$1.45
Varian Associates Palo Alto Calif
ANALYSIS OF DRUGS AND DRUG METABOLITES IN BODY FLUIDS BY CVA-MASS SPECTROMETRY. ANALYSIS OF MORPHINE IN URINE BY CVA-MASS SPECTROMETRY.
Final rept.,
Seth R. Abbott, Kay O. Loeffler, and James T. Arnold. Feb 74, 154p* LWL-CR-02P72
Contract DAAD05-72-C-0111

Descriptors: *Mass spectrometry, *Drugs, *Morphine, Body fluids, Urine, Chemical analysis, Detection, Drug abuse, Drug addiction, Heroin, Barbiturates, Amphetamines, Narcotics, Tranquilizers, Hallucinogens.
Identifiers: Methadone.

Contents:
- The problem -- drug abuse;
- The concept of CVA-mass spectrometry;
- CVA-mass spectrometry of standard solutions of drugs;
- Therapeutic non-abuse drug analyses;
- Drug poisoning analyses;
- Rapid drug screening;
- Detection of heroin abuse;
- Detection of drugs in saliva, breath, skin wipings;
- Detection of methadone and amphetamine use;
- Description of instrument.

AD-775 517/6GA PC$3.00/MF$1.45
Rochester Univ N Y Dept of Physics and Astronomy
SPONTANEOUS HIGH INTENSITY PULSE EFFECTS.
Final rept. 1 Jun 70-31 May 72,
Joseph H. Eberly. Feb 74, 12p AROD-8915.12-P
Grant DA-ARO-D-31-124-70-G86

Descriptors: *Atomic energy levels, *Fluorescence, Coherent radiation, Electron transitions.
Identifiers: *Superradiance, Spontaneous emission, Two level atoms.

The report presents a summary of investigations concerned with experimentally relevant restrictions on peak power radiated by many excited atoms. In particular, the atoms are spread over a macroscopic volume and are subject to inhomogeneous broadening of the atomic lineshape. (Author)

AD-775 519/2GA PC$3.00/MF$1.45
Rochester Univ N Y Dept of Physics and Astronomy
INTENSE PULSE PHENOMENA.
Final rept. 1 Jun 72-28 Feb 73,
Joseph H. Eberly. Mar 74, 10p AROD-8915.13-P
Grant DA-ARO-D-31-124-72-G79

Descriptors: *Atomic energy levels, *Electron transitions, *Light pulses, Frequency modulation, Frequency shift.
Identifiers: *Superradiance, *Spontaneous emission.

The report discusses investigations concerned with high power pulses and spontaneous emission, and associated intrinsic optical frequency modulation. It is established that such frequency modulation must be almost undetectably small for present nanosecond and even picosecond pulses. A method is developed for dealing with frequency shifts in spontaneous emission which avoids serious errors caused by the rotating wave approximation. (Author)

AD-775 521/8GA Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
DYNAMIC NUCLEAR POLARIZATION IN PHOSPHONITRILIC FLUORIDES.
Edward H. Poindexter, Richard D. Bates, Jr., N. L. Paddock, and Joseph A. Potenza. 31 Jul 72, 7p
Availability: Pub. in Jnl. of the American Chemical Society, v95 n6 p1714-1717, 21 Mar 73.

Descriptors: *Nuclear magnetic resonance, Molecular orbitals, Fluorides, Coupling(Interaction).
Identifiers: *Phosphonitrile halides, *Dynamic nuclear polarization, Nuclear magnetic resonance(Fluorine 19), Nuclear magnetic resonance(Phosphorus 31).

Dynamic nuclear polarization has been observed in solutions of a series of phosphonitrilic fluorides with three free radicals. Generally, much weaker scalar coupling between the free radicals. The DNP results are correlated with other details of receptor molecular orbitals and radical-receptor collision attitudes. (Modified author abstract)

AD-775 541/6GA Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
STUDIES ON AQUEOUS HF SYSTEMS.
Mark Salomon, and Brian K. Stevenson. 13 Aug 73, 4p
Revision of report dated 5 Mar 73.
Availability: Pub. in Jnl. of Chemical and Engineering Data, v19 n1 p42-44 Jan 74.

Descriptors: *Chemical equilibrium, Complex compounds, Fluorides, Inorganic acids.
Identifiers: *Hydrofluoric acid.

The thermodynamic properties of equilibria H(+) + F(-) = HF and HF + F(-) = HF2(-) were evaluated at 15, 25, and 35C in water. NaNO3 was used to maintain a constant ionic strength of 0.5000m. No evidence was found to indicate the presence of complexes higher than HF2(-) or of polynuclear complexes. (Author)

AD-775 552/3GA Reprint
California Univ Berkeley Dept of Mechanical Engineering
AMMONIA OXIDATION IN AN ARC-HEATED FLOW REACTOR,
Melvyn C. Branch, and Robert F. Sawyer. 1973, 13p AFOSR-TR-74-0212
Grant AF-AFOSR-2299-72
Availability: Pub. in Proceedings of the International Symposium on Combustion (14th), Pennsylvania State Univ., University Park, Pa., 20-25 Aug 72 p967-974 1973.

Descriptors: *Ammonia, *Oxidation, Gas flow, Oxygen, Reaction kinetics, Combustion.

The over-all kinetics of the gas-phase oxidation of ammonia has been investigated in an arc-heated flow reactor, over a temperature range of 1106-1377K. Concentration profiles through the distributed reaction zone and temperature profiles were obtained. Reaction-rate constant and reaction orders for the over-all reaction were determined. (Modified author abstract)

AD-775 565/5GA Reprint
IBM Research Lab San Jose Calif
ANHARMONICITY IN ROTATIONAL AND VIBRATIONAL EXCITATION OF H2 BY LI(+) COLLISIONS.
Technical rept.,
Joachim Schaefer, William A. Lester, Jr., Donald Kouri, and Charles A. Wells. 12 Oct 73, 9p Rept no. TR-3
Contract N00014-72-C-0244
Prepared in cooperation with Houston Univ., Tex. Dept. of Chemistry.
Availability: Pub. in Chemical Physics Letters, v24 n2 p185-190, 15 Jan 74.

Descriptors: *Hydrogen, *Anharmonic oscillators, Molecular vibration, Cross sections, Excitation, Lithium, Ions, Molecular rotation, Molecular energy levels.
Identifiers: *Ion molecule interactions.

Integral cross sections for pure rotational and vibrational-rotational excitation of H2 by Li(+) impact are computed by close-coupling methods using vibrational functions that are numerical solutions of the one-dimensional radial Schrodinger equation for harmonic, Morse, and adiabatically corrected Kolos-Wolniewicz (KW) potential functions. (Modified author abstract)

AD-775 584/6GA PC$3.00/MF$1.45
Wisconsin Univ Madison Mathematics Research Center
ON THE BALANCE EQUATIONS FOR A MIXTURE OF GRANULAR MATERIALS.
Technical summary rept.,
S. L. Passman. Jan 74, 22p Rept no. MRC-TSR-1390
Contract DA-31-124-ARO(D)-462

Descriptors: *Mixtures, *Particles, *Diffusion, Continuum mechanics, Entropy, Equations of motion.

Balance laws for constituents of a mixture of a finite number of granular materials are given. It is shown that the resulting balance laws for the mixture as a whole generalize those previously given for a single granular material. (Author)

AERE-M-2687 PC$3.00/MF$1.45
Ukaea Research Group, Harwell. Atomic Energy Research Establishment.
DETERMINATION OF CERIUM IN STEEL BY STABLE ISOTOPIC DILUTION.
R. K. Webster, T. C. Hughes, and D. Gibbons. Nov 73, 5p
U.S. Sales Only.

Descriptors: (*Cerium, *Isotope dilution), (*Steels, *Chemical analysis), Cerium 142, Quantitative chemical analysis, Sensitivity.

For abstract, see NSA 29 05, number 09800.

AERE-R-7563 PC$3.00/MF$1.45
Ukaea Research Group, Harwell. Atomic Energy Research Establishment.
TWO NOMOGRAMS FOR GAS CHROMATOGRAPHY CALIBRATIONS.
M. H. Hurdus. Nov 73, 14p
U.S. Sales Only.

Descriptors: (*Gas chromatography, *Calibration), (*Helium, Gas chromatography), Containers, Gas analysis, Gases, Impurities, Nomograms, Quantitative chemical analysis, Quantity ratio.

For abstract, see NSA 29 05, number 09725.

CEA-CONF-2196 PC$3.00/MF$1.45
TRANSFER OF COLLISIONAL EXCITATION IN THE NEUTRAL VAPOR OF CESIUM.
M. Pimbert, and J. L. Rocchiccioli. 12 Apr 72, 6p CONF-720552-3
In French. U.S. Sales Only.

Descriptors: (*Nitrogen, *Energy-level transitions), (*Hydrogen, Energy-level transitions), Cesium, Collisions, Cross sections, Excitation, Molecules, Rare gases.

For abstract, see NSA 29 05, number 12439.

CEA-CONF-2309 PC$3.00/MF$1.45
CONTROL OF THE QUALITY OF NUTRIENTS BY ANALYSIS OF MINERALS IN PLANT MATERIAL.
C. Gountchev, A. Fourcy, M. Bechard, R. Bittel, and D. Schaal. 1972, 10p CONF-7210101-1
In French. U.S. Sales Only.

Descriptors: (*Bromine, *Activation analysis), (*Arsenic, Activation analysis), (*Mercury, Activation analysis), (*Fluorine, Activation analysis), Grapes, Nutrients, Quantitative chemical analysis, Radioactivation, Vegetables.

For abstract, see NSA 29 05, number 09727.

CEA-CONF-2310 PC$3.75/MF$1.45
DETERMINATION OF THE CONDITIONS FOR THE HYDRODYNAMIC AND THERMAL FUNCTIONING OF INDUSTRIAL CIRCUITS CARRYING BOILING MIXTURES.
J. Croix, and S. Fabrega. 32p CONF-720686-2
In French. U.S. Sales Only.

Descriptors: (*Water, *Boiling), (*Ethanol, Boiling), H codes, Hydrodynamics, Mixtures, Thermodynamic properties.

For abstract, see NSA 29 05, number 10064.

CEA-CONF-2330 PC$3.00/MF$1.45
CONCERNING THE DETERMINATION OF TRACES OF OXYGEN AND CARBON IN SODIUM OR CESIUM BY MEANS OF ACTIVATION ANALYSIS.
C. Engelmann, F. Nordmann, and G. Tinelli. 10 Apr 73, 18p CONF-730449-2
In French. U.S. Sales Only.

Descriptors: (*Oxygen, *Activation analysis), (*Carbon, Activation analysis), (*Sodium, Activation analysis), (*Cesium, Activation analysis), Bremsstrahlung, Photonuclear reactions, Quantitative chemical analysis, Trace amounts.

For abstract, see NSA 29 05, number 09728.

CEA-CONF-2331 PC$3.25/MF$1.45
IMPORTANCE AND ROLE OF NUCLEAR CONSTANTS IN ACTIVATION ANALYSIS USING CHARGED PARTICLES OR GAMMA PHOTONS.
C. Engelmann. 19 Jan 73, 25p CONF-730302-16, SM-170/66
In French. U.S. Sales Only.

Descriptors: Accuracy, Activation analysis, Calibration, Charged particles, Nuclear reactions, Photons.

For abstract, see NSA 29 05, number 09729.

CEA-CONF-2414 PC$3.75/MF$1.45
Cea Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France). Div. De Metallurgie et d'Etude des Combustibles Nucleaires.
TWO YEARS OF OPERATION OF THE SHIELDED MICROPROBE: EVALUATION AND THE FUTURE.
J. Bazin, M. Perrot, P. Rousset, and N. Vignesoult. 31p CONF-730667-1
In French. U.S. Sales Only.

Descriptors: (*Uranium, *Chemical analysis), (*Uranium dioxide, Chemical analysis), (*Plutonium oxides, Chemical analysis), Microanalysis, Probes, Qualitative chemical analysis, Quantitative chemical analysis, Reviews.

For abstract, see NSA 29 05, number 09801.

CEA-CONF-2445 PC$3.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Cadarache, 13 - Saint-Paul-les-Durance (France); Florida Univ., Gainesville (Usa). Coll. Of Medicine.
NEW APPROACH TO THE STUDY OF AQUEOUS SOLUTIONS OF CO SUB 2 .
R. H. Gerster, T. H. Maren, and D. N. Silverman. 1973, 20p CONF-730525-4
U.S. Sales Only.

Descriptors: (*Carbon 13, *Isotopic exchange), (*Oxygen 18, Isotopic exchange), Aqueous solutions, Carbon dioxide, Reaction kinetics.

For abstract, see NSA 29 05, number 09897.

CEA-R-4478 PC$6.00/MF$1.45
Cea Centre d'Etudes de Bruyeres-le-Chatel, 92 - Montrouge (France).
PULSE POLAROGRAPHY IN NONAQUEOUS MEDIA APPLICATION TO THE DETERMINATION OF TRACE ELEMENTS IN PLUTONIUM.
C. Bergey. Nov 73, 78p
In French. U.S. Sales Only.

Descriptors: (*Plutonium, *Chemical analysis), (*Bismuth, *Polarography), (*Mercury, Polarography), (*Lead, Polarography), Amides, Antimony, Cadmium, Cobalt, Copper, Dmso, Gallium, Indium, Iron, Manganese, Nickel, Quantitative chemical analysis, Silver, Solvent extraction, Trace amounts, Uranium, Vanadium.

For abstract, see NSA 29 05, number 09802.

COM-74-10443/1GA Reprint
Columbia Univ., New York. Dept. of Chemistry.
CALCULATION OF HIGH-ORDER ROTATIONAL CENTRIFUGAL-DISTORTION MATRIX ELEMENTS FOR A HUND'S CASE (A) BASIS SET,
R. N. Zare, A. L. Schmeltekopf, D. L. Albritton, and W. J. Harrop. 14 May 73, 9p NOAA-74011811
Sponsored in part by National Science Foundation, Washington, D.C.
Pub. in Jnl. of Molecular Spectroscopy, v48 n1 p174-180 Oct 73.

Descriptors: *Diatomic molecules, *Microwave spectroscopy, Rotational energy levels, Centrifugal force.

It is of practical importance, both in optical and in microwave studies, to find a general means of including rotational centrifugal-distortion corrections to high order in the calculation of the energy levels of a diatomic molecule. The recursion relation for the Hund's case (a) matrix elements of R(2k) should facilitate the more accurate determination of molecular constants from measured line positions when high-order rotational centrifugal-distortion corrections must be considered.

COM-74-10469/6GA PC$6.00/MF$1.45
National Bureau of Standards, Washington, D.C.
SURVEY OF VARIOUS APPROACHES TO THE CHEMICAL ANALYSIS OF ENVIRONMENTALLY IMPORTANT MATERIALS.
Final rept.,
Bernard Greifer, and John K. Taylor. Jul 73, 238p*
NBSIR-73-209
EPA-IAG-0215(D)

Descriptors: *Trace elements, *Industrial wastes, *Water analysis, Reviews, Water pollution, Mass spectroscopy, X ray analysis, Spectrochemical analysis, Polarography, Potentiometric analysis, Atomic spectroscopy, Cost estimates.
Identifiers: *Water pollution detection.

Various approaches to the chemical analysis of heavy industry process materials and effluents for trace element constituents that might contribute to environmental pollution are summarized. The capabilities and costs of nuclear methods, spark source mass spectrometry, x-ray fluorescence and electron microprobe spectrometry, atomic absorption spectrometry, absorption spectrophotometry, atomic emission spectroscopy, voltammetry (polarography) and potentiometry (ion-selective electrodes) for determining traces (less than 100 parts per million) of mercury, beryllium, cadmium, arsenic, vanadium, manganese, nickel, antimony, chromium, zinc, copper, lead, selenium, boron, fluorine, lithium, silver, tin, iron, strontium, sodium, potassium, calcium, silicon, magnesium, uranium, and thorium in such matrices as fly ash, coal, oil, ores, minerals, metals, alloys, organometallics, incinerator particulates, slurry streams, and feeds to and from sedimentation processes have been assessed. The report includes a critically selected bibliography of the current literature. (Author)

COM-74-50116/4GA Not available NTIS
National Bureau of Standards, Washington, D.C.
STATUS REPORT ON CRITICAL COMPILATION OF PHYSICAL CHEMICAL DATA.
Final rept.,
D. R. Lide, Jr., and S. A. Rossmassler. 1973, 24p
Pub. in Annual Review of Physics and Chemistry, v24 p135-158 1973.

Descriptors: *Physical chemistry, *Information, Data.

The significance of data evaluation and the importance of sources of reliable reference data are pointed out. A review is provided of major past and present data compilation activities of interest to physical chemists, including early efforts (before 1930); isolated programs in the period 1930-1960; the National Standard Reference Data System; other government and non-government programs; other national programs; and international programs. A rationale and discussion of methodology of data evaluation are presented with brief illustrations. Finally, three types of data sources are listed: systematic publication series, data centers, and recent compendia.

COM-74-50117/2GA Not available NTIS
National Bureau of Standards, Washington, D.C.
THERMAL EXPANSION AND LOW TEMPERATURE PHASE TRANSITION OF THALLOUS AZIDE,
F. A. Mauer, C. R. Hubbard, and T. A. Hahn. 1973, 7p
Sponsored in part by Picatinny Arsenal, Dover, N.J.
Pub. in Jnl. of Chemical Physics, v59 n7 p3770-3776, 1 Oct 73.

Descriptors: *Azides, *Thallium inorganic compounds, *Crystal lattices, Thermal expansion, Phase transformations, X ray diffraction.
Identifiers: *Thallium azides.

Thallous azide, TlN3, is tetragonal at room temperature. It transforms at 248K to a phase that can be indexed on the basis of an orthorhombic cell. Lattice parameters of the tetragonal phase have been determined by the Bond single crystal method at intervals of approximately 25K from 248 to 498K. Single crystals do not survive the transition, so the parameters of the orthorhombic phase were measured by powder diffraction at intervals of 25K down to 133K. Thermal expansion parameters show anomalies that are believed to be the result of changes in the orientation of azide ions.

COM-74-50118/0GA Not available NTIS
National Bureau of Standards, Washington, D.C.
CENTRIFUGAL DISTORTION EFFECTS IN SF2: CALCULATION OF THE FORCE FIELD AND INFRARED SPECTRUM.
Final rept.,
W. H. Kirchhoff, D. R. Johnson, and F. X. Powell. 1973, 8p
Pub. in Jnl. of Molecular Spectroscopy, v48 n1 p157-164 Oct 73.

Descriptors: *Sulfur fluorides, *Microwave spectra, Molecular structure, Molecular vibration.
Identifiers: Coriolis coupling constant.

Measurements of the microwave spectrum of SF2 have been extended up to J = 43 in order to account for the effects of centrifugal distortion. Seventy-five transitions have been included in a weighted least squares fit of the measured spectrum with an rms deviation of 0.078 MHz. The force field for SF2 has been determined from the centrifugal distortion constants. The vibrational spectrum, as yet unobserved, has been predicted from the force field as have been the Coriolis coupling constants and the average structure.

COM-74-50120/6GA Not available NTIS
National Bureau of Standards, Washington, D.C.
CALCULATION OF THE ABSOLUTE INFRARED INTENSITIES FOR THE 0-1, 0-2 AND 1-2 VIBRATION-ROTATION TRANSITIONS IN THE GROUND STATE OF NO(+).
Final rept.,
Frank P. Billingsley, II. 1973, 7p
Pub. in Chemical Physics Letters, v23 n2 p160-166, 15 Nov 73.

Descriptors: *Nitrogen oxide(NO), *Infrared spectra, Ions, Dipole moments.

The absolute infrared intensities of the 0-1, 0-2 and 1-2 vibration-rotation bands in the singlet Sigma(+) ground state have been calculated from first principles. The dipole moment function for NO(+) was determined in the region of the equilibrium internuclear separation by an accurate multi-configuration self-consistent-field procedure. The dipole matrix elements over vibration states were solves exactly using numerical techniques. The ratio of the calculated integrated absorption coefficients for the fundamental and first overtone is in reasonable agreement with an estimate based on observation of these bands in NO(+) at high altitudes in the upper atmosphere.

COM-74-50122/2GA Not available NTIS
National Bureau of Standards, Washington, D.C.
STRUCTURAL IMPLICATIONS OF THE MICROWAVE SPECTRUM OF HEXAFLUOROPROPENE.
Final rept.,
E. Jean Jacob, and David R. Lide, Jr. 1973, 5p
Pub. in Jnl. of Chemical Physics, v59 n11 p5877-5881, 1 Dec 73.

Descriptors: *Fluorine aliphatic compounds, *Microwave spectra, Molecular rotation, Molecular energy levels.
Identifiers: Propene/hexafluoro.

Analysis of the microwave spectrum of hexafluoropropene, C3F6, has yielded rotational con-

stants for the ground vibrational state of 2557.88, 1255.033, and 987.082 MHz. Assignments have also been made on the first four excited states of the CF3 torsional mode and on the first excited state of another low-lying skeletal mode. A rough estimate of 350/cm has been obtained for the barrier to internal rotation of the CF3 group. The ground-state moments of inertia are consistent with the expected geometry of the molecule, in which all atoms are coplanar except for two equivalent F atoms in the CF3 group.

COM-74-50124/8GA Not available NTIS
National Bureau of Standards, Washington, D.C.
CALIBRATION FOR INTERELEMENT EFFECTS IN X-RAY FLUORESCENCE ANALYSIS.
Final rept.,
Stanley D. Rasberry, and Kurt F. J. Heinrich. Jan 74, 9p
Pub. in Analytical Chemistry, v46 n1 p81-89 Jan 74.

Descriptors: *X ray fluorescence, *X ray analysis, Calibrating, Iron alloys, Nickel containing alloys, Chromium containing alloys.
Identifiers: X ray fluorescence analysis.

A new empirical method for the calibration of x-ray fluorescence analysis in the presence of interelement effects is given. The effects of secondary fluorescence and of absorption are considered separately, with different expressions, in the calibration equation. The new approach is compared with empirical methods previously proposed by other authors, and is found to be accurate and applicable over wide ranges of composition, even when the number of standards available is limited. An alloy system in which the interelement effects are severe (Fe-Ni-Cr, over a range of composition from 0 to 100%), is studied experimentally; also evaluated are data, previously presented by other authors, for the calcium carbonate - silica system.

COM-74-50126/3GA Not available NTIS
National Bureau of Standards, Washington, D.C.
THE THRESHOLD REGION OF THE METHANE CARBON K-ABSORPTION SPECTRUM.
Final rept.,
P. S. Bagus, M. Krauss, and R. E. LaVilla. 1973, 5p
Pub. in Chemical Physics Letters, v23 n1 p13-17, 1 Nov 73.

Descriptors: *Methane, Absorption spectra, Molecular spectroscopy, Electron transitions.

The carbon K-absorption of CH4 is analyzed with the help of an ab initio calculation of the Rydberg states of 1a(1)(-1) hole state. The strong absorption peak at 288.3 eV is identified as the first Rydberg 2t* from 1a(1), whose calculated ionization potential is in good agreement with experiment. The weak peak at 287.2 eV is interpreted as a vibronic transition to the 3a1(3s) Rydberg. An estimate of its oscillator strength as 10% of the allowed 2t(3p) Rydberg line is consistent with experiment. For the case of CD4, this weak forbidden transition was estimated to be 20% of the allowed 2t(3p) Rydberg line.

COM-74-50127/1GA Not available NTIS
National Bureau of Standards, Washington, D.C.
OPTICAL PUMPING OF MOLECULES. II. RELAXATION STUDIES.
Final rept.,
R. E. Drullinger, and R. N. Zare. 1973, 10p
Sponsored in part by National Science Foundation, Washington, D.C.
Pub. in Jnl. of Chemical Physics, v59 n8 p4225-4234, 15 Oct 73.

Descriptors: *Sodium, *Optical pumping, Relaxation time, Laser beams.

The (V double prime=3, J=43) has been aligned using the 4880-A line of a cw argon ion laser as a light source. The relaxation of this alignment is measured upon addition of foreign gas. In a low-pressure regime, where the mean free path exceeds the diameter of the light beam which both pumps and samples the alignment, the relaxation of the alignment versus pressure shows a 'dog-leg shape' consisting of two linear regions. The first linear region corresponds to both elastic (velocity-changing) and inelastic (primarily rotational transfer) collisional relaxation whereas the second corresponds purely to inelastic collisional relaxation. The former process is dependent on the mode structure of the laser and shows saturation with increased pressure. In this low-pressure region, the measured cross sections are shown to be lower bounds to the true cross sections and excitation by a multimode laser is shown to be inequivalent to excitation by a white light source when the width of the holes in the velocity distribution of the absorber molecules are nonoverlapping.

COM-74-50128/9GA Not available NTIS
National Bureau of Standards, Washington, D.C.
THE METHYL RADICAL COMBINATION RATE CONSTANT AS DETERMINED BY KINETIC SPECTROSCOPY.
Final rept.,
Arnold M. Bass, and Allan H. Laufer. 1973, 13p
Sponsored in part by National Aeronautics and Space Administration, Greenbelt, Md.
Pub. in International Jnl. of Chemical Kinetics, v5 p1053-1065 1973.

Descriptors: *Photolysis, Ultraviolet radiation, Reaction kinetics.
Identifiers: *Methyl radical, Flash photolysis.

The rate constant for the reaction CH3+CH3+M to C2H6+M (M=He) has been determined by means of vacuum ultraviolet flash photolysis and time-resolved kinetic spectroscopic observations of the 1504-A absorption band of CH3. The measurements made using three different sources of methyl radicals (azomethane, dimethyl-mercury, and ketene-hydrogen) were in accord and yielded a value for the rate constant. A detailed error analysis is presented. The f-value for the 1504-A band of CH3 was determined.

COM-74-50132/1GA Not available NTIS
National Bureau of Standards, Washington, D.C.
INTRINSIC VISCOSITY MEASUREMENTS ON RODLIKE POLY(N-BUTYL ISOCYANATE) AND POLY(N-OCTYLISOCYANATE).
Final rept.,
A. J. Bur, and L. J. Fetters. 1973, 6p
Pub. in Macromolecules, v6 n6 p874-879 Nov/Dec 73.

Descriptors: *Polyurethane resins, *Molecular structure, Length, X ray analysis, Viscosity.

Previous calculations of the molecular length of rodlike poly(n-butyl isocyanate), (-CO-NC4H9-)n, from dielectric relaxation time measurements have not shown satisfactory agreement with the results from X-ray and light-scattering measurements. Here, the authors examine this conflict by extending their hydrodynamic experiments to include intrinsic viscosity measurements on well-characterized low molecular weight samples of poly(n-butyl isocyanate) (PBIC) and poly(n-octyl isocyanate) (POIC), (-CO-NC8H17-)n. Using the Kirkwood-Auer-Riseman equation relating intrinsic viscosity and rod dimensions, the intermonomer translation along the rod axis was calculated. Its difference from normal measurement appears to be the application of hydrodynamic equations to a physical situation which does not satisfy the model assumptions.

COM-74-50144/6GA Not available NTIS
National Bureau of Standards, Washington, D.C.
POLAROGRAPHY. CONSTANT-CURRENT COULOMETRY. DIFFERENTIAL THERMAL ANALYSIS.
Final rept.,
Harvey W. Berger. 1972, 8p
Pub. in American Society for Testing Materials, Special Technical Publication, v500 p556-563 pts. 10.7, 10.8 and 10.9 in Paint Testing Manual 1972.

Descriptors: *Differential thermal analysis, *Coulometry, *Polarography.
Identifiers: Constant current coulometry.

The report briefly discusses polarography which is an instrumental method of analysis based on the evaluation of current-voltage curves that are obtained during the electro-reduction or oxidation of a chemical compound. Also covered is constant current coulometry, a highly accurate analytical technique based on Faraday's Law and involves measuring the number of coulombs (current x time) that pass through a chemical cell, as well as differential thermal analysis, used for identifying or measuring the physical and chemical changes that occur in materials as they are heated or cooled.

COM-74-50145/3GA Not available NTIS
National Bureau of Standards, Washington, D.C.
SKEW-REFLECTION X-RAY MICROSCOPY OF THE VAPOR-GROWTH SURFACE OF AN A12O3 SINGLE CRYSTAL.
Final rept.,
E. N. Farabaugh, H. S.Parker, and R. W. Armstrong. 1973, 5p
Pub. in Jnl. of Applied Crystallography, v6 pt6 p482-486 Dec 73.

Descriptors: *Aluminum oxide, *X ray diffraction, *X ray microscopy, Microstructure, Single crystals, Crystal growth.

The most commonly used geometry for the Berg-Barrett X-ray microscopy uses the zero-layer reflections as described by Newkirk. It can be shown that non-zero-layer reflections, skew-plane reflections, can be used equally well to obtain X-ray micrographs. The analysis of the stereographic representation of the skew-reflection geometry demonstrates the many usable reflections and gives the conditions for minimum image distortion. In these X-ray micrographs the contributions to diffraction contrast from shadowing and sub-boundaries can be identified. An estimate of the height of steps occurring on the crystal surface can also be made.

COM-74-50146/1GA Not available NTIS
National Bureau of Standards, Washington, D.C.
NEUTRON QUASIELASTIC SCATTERING STUDY OF SH(-) REORIENTATION IN RUBIDIUM HYDROSULFIDE IN THE INTERMEDIATE TEMPERATURE TRIGONAL PHASE.
Final rept.,
J. M. Rowe, R. C. Livingston, and J. J. Rush. 1973, 4p
Pub. in Jnl. of Chemical Physics, v59 n12 p6652-6655, 15 Dec 73.

Descriptors: *Neutron scattering, *Sulfur inorganic compounds, *Ions, *Molecular structure, *Molecular vibration, Crystal structure.

The reorientation of (SH)(-) ions in the trigonal phase of RbSH has been investigated by neutron quasielastic scattering at 373K and 393K. The quasielastic peaks show a distinct two-component (elastic and broadened) structure, the behavior of which is used to establish that the ions are reorienting between two equilibrium sites. Mean square amplitudes of hydrogen vibrations are determined from the momentum transfer dependence of the total intensity, and found to be higher than that found in the high temperature fcc phase, even though the rate of reorientation is an order of magnitude faster in the cubic phase.

COM-74-50149/5GA Not available NTIS
National Bureau of Standards, Washington, D.C.
COLLISIONAL DEACTIVATION OF NH2(A DOUBLET A(1)).
Final rept.,
M. Lenzi, J. R. McNesby, A. Mele, and C. Nguyen Xuan. 1972, 5p
Pub. in Jnl. of Chemical Physics, v57 n1 p319-323, 1 Jul 72.

Descriptors: *Photolysis, *Ammonia, Far ultraviolet radiation, Reaction kinetics, Free radicals, Jupiter(Planet), Planetary atmospheres.
Identifiers: Jupiter atmosphere.

NH2(A doublet A(1)) was produced by photolysis of ammonia in the vacuum ultraviolet. Deactivation rates of this radical were measured by the quenching of fluorescence in NH3, CH4, H2, N2, He, Ne, Ar, Kr, Xe. An estimate of the lifetime of spontaneous radiative decay is suggested. Application of the results of the dynamics of the Jovian atmosphere is reported.

COM-74-50151/1GA Not available NTIS
National Bureau of Standards, Washington, D.C.
CORRELATION IN EXCITED STATES OF ATOMS.
1973, 46p
Pub. in Advances in Atomic and Molecular Physics, v9 p1-46 1973.

Descriptors: *Atomic energy levels, *Quantum mechanics, Wave functions.
Identifiers: Oscillator strengths.

The report reviews the current status of work on electron correlation in excited states of light atoms through approximately Z=20. The primary orientation is towards ab initio correlation calculations, so that semi-empirical methods are not discussed except insofar as they relate directly to the correlation problem. Furthermore, the discussion is restricted to the effects of correlation on only two properties, namely energies and oscillator strengths. After a brief statement and description of the correlation problem in general, the authors concentrate on (1) methods currently employed to attack excited state correlation, and (2) a description of some of the results obtained so far which appear to be peculiar to excited states. Since most excited state correlation calculations have relied on the multi-configuration expansion, this method is described at some length. Allowing the reference state orbitals to relax in the field of the virtual configuration leads to the multi-configuration self-consistent field approximation, and this method is described as well. Some discussion is given of the role of pair correlations in excited states.

COM-74-50159/4GA Not available NTIS
National Bureau of Standards, Washington, D.C.
THE CONFORMATION OF ADSORBED BLOOD PROTEINS BY INFARARED BOUND FRACTION MEASUREMENTS.
Final rept.,
Bruce W. Morrissey, and Robert R. Stromberg.
Jan 74, 13p
Pub. in Jnl. of Colloid and Interface Science, v46 n1 p152-164 Jan 74.

Descriptors: *Surface chemistry, *Blood proteins, Infrared spectroscopy, Adsorption, Proteins, Blood coagulation.
Identifiers: Blood compatible materials.

The likelihood that surface-induced blood coagulation results from specific protein-material interactions has led to a study of the conformation of adsorbed blood proteins. Infrared difference spectroscopy was used to determine the bound fraction, i.e., the fraction of carbonyl groups of an adsorbed molecule directly interacting with the surface, of serum albumin, prothrombin, and fibrinogen in situ. Measurements were carried out on individual proteins as a function of the amount adsorbed, time of absorption, pD, and ionic strength using a silica surface.

COM-74-50169/3GA Not available NTIS
National Bureau of Standards, Washington, D.C.
STRUCTURE STUDIES IN LIQUID HE4.
Final rept.,
Harold J. Raveche, and Raymond D. Mountain.
1974, 13p
Pub. in Physical Review A, General Physics, v9 n1 p435-447 Jan 74.

Descriptors: *Liquid helium, *Helium 4, *Atomic structure, Neutron diffraction, Wave functions, Correlation.

The authors investigate, using neutron-diffraction data, several properties of the local atomic structure in liquid He4, both above and below the superfluid transition. Distinguishing features of the pair-correlation function are summarized and the diffraction data are employed to investigate a proposed form for the condensate fraction as a function of temperature. The pair-correlation function is used to examine an inequality that gives an upper bound that is close to the observed values, and also to examine the use of approximate integral equations for the ground-state wave function. Triplet correlations and closure approximations are studied from the isothermal density derivative of the pair-correlation function. The results suggest that, analogous to the pair-correlation function, the triplet-correlation function shows a temperature dependence that is not observed in simple classical fluids.

COM-74-50180/0GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Boulder, Colo. Cryogenics Div.
THERMOPHYSICAL PROPERTIES OF NITROGEN FROM THE FUSION LINE TO 3500 R (1944 K) FOR PRESSURES TO 150,000 PSIA (10342 X 10 TO THE 5TH POWER N/SQ M).
Technical note,
R. T. Jacobsen, R. B. Stewart, R. D. McCarty, and H. J. M. Hanley. Dec 73, 162p NBS-TN-648
Sponsored in part by National Aeronautics and Space Administration, Houston, Tex. Manned Spacecraft Center.
Paper copy available from GPO $1.25 as C13.46:648.

Descriptors: *Thermophysical properties, *Nitrogen, Tables(Data), High pressure tests, Thermodynamic properties, Equations of state, Vapor pressure, Specific heat, Melting, Transport properties, Refractivity, Prandtl number, Dielectric properties.

Tables of thermophysical properties of nitrogen are presented for temperatures from the fusion line to 3500 R for pressures to 3000 psia, and from the fusion line to 1500 R for pressures above 3000 psia to 150,000 psia. The tables include values of entropy, enthalpy, internal energy, density, specific volume, velocity of sound, specific heats (C(v) and C(p)), thermal conductivity, viscosity, thermal diffusivity, Prandtl number, and the dielectric constant for selected isobars. Additional tables are included for values of PVT relationships which have special utility in heat transfer calculations. Tables of selected isobars for the liquid and vapor phases, and for the saturated vapor and saturated liquid are included. An equation of state is presented for liquid and gaseous nitrogen for the temperature and pressure ranges of these tables. In the determination of the equation of state, all of the P-rho-T (pressure-density-temperature) data available from the published literature were reviewed, and appropriate corrections made to bring experimental temperatures into accord with the International Practical Temperature Scale of 1968. A vapor pressure equation, melting curve equation, and an equation to represent the ideal gas heat capacity of nitrogen are also presented.

COO-1109-71 PC$5.25/MF$1.45
Arizona State Univ., Tempe (Usa).
PSEUDOPHASE BEHAVIOR IN THE EPSILON AND IOTA REGIONS OF THE PRASEODYMIUM OXIDE–OXYGEN SYSTEM.
R. P. Turcotte, M. S. Jenkins, and L. Eyring. 1973, 65p

Descriptors: (*Praseodymium oxides, *Phase diagrams), (*Oxygen, Phase diagrams), High temperature, Phase transformations, Pressure dependence, Stoichiometry, Thermal gravimetric analysis, X-ray diffraction.

For abstract, see NSA 29 05, number 10593.

COO-623-196 PC$3.00/MF$1.45
United States Naval Academy, Annapolis, MD.; Case Western Reserve Univ., Cleveland, Ohio (Usa).
LOW FREQUENCY DIELECTRIC CONSTANT OF VITREOUS ARSENIC TRISULFIDE.
J. Fontanella, C. Andeen, and D. Schuele. 1973, 6p

Descriptors: (*Arsenic sulfides, *Dielectric properties), Glass, Khz range 01-100, Medium temperature.

For abstract, see NSA 29 05, number 12445.

COO-623-197 PC$3.00/MF$1.45
Case Western Reserve Univ., Cleveland, Ohio (Usa); United States Naval Academy, Annapolis, MD.
EFFECT OF OH EXP - ON THE LOW FREQUENCY DIELECTRIC CONSTANT OF VITREOUS SILICA.
C. Andeen, D. Schuele, and J. Fontanella. 1973, 20p

Descriptors: (*Silicon oxides, *Dielectric properties), Doped materials, Hydroxides, Impurities.

For abstract, see NSA 29 05, number 12446.

DP-1336 PC$4.00/MF$1.45
Du Pont de Nemours (E.I.) and CO., Aiken, S.C. (Usa). Savannah River Lab.
DISTRIBUTION OF SELECTED LANTHANIDES AND ACTINIDES BETWEEN 30% TBP IN N-PARAFFIN AND VARIOUS METAL NITRATE SOLUTIONS.
M. C. Thompson. Nov 73, 28p
Contract AT(07-2)-1

Descriptors: (*Americium, *Solvent extraction), (*Curium, Solvent extraction), (*Cerium, Solvent extraction), (*Neodymium, Solvent extraction), Actinides, Aluminium nitrates, Aqueous solutions, Dtpa, Europium, Lanthanum, Lithium nitrates, Manganese, Mercury, Nitric acid, Paraffin, Ph value, Praseodymium, Rare earths, Samarium, Sodium nitrates, Tbp.

For abstract, see NSA 29 05, number 09859.

EURISOTOP-87 PC$5.75/MF$1.45
Commission of the European Communities, Brussels (Belgium). Bureau Eurisotop.
DETERMINATION OF CARBON AND NITROGEN IN SILICON AND GERMANIUM.
W. Gebauhr, and J. Martin. Aug 73, 75p
In German. U.S. Sales Only.

Descriptors: (*Carbon, *Activation analysis), (*Nitrogen, Activation analysis), (*Silicon, Activation analysis), (*Germanium, Activation analysis), Alpha reactions, Deuteron reactions, Helium 3 reactions, Proton reactions, Quantitative chemical analysis.

For abstract, see NSA 29 05, number 09759.

HMI-B-143 PC$5.25/MF$1.45
Hahn-Meitner-Institut fuer Kernforschung Berlin G.M.B.H. (F.R. Germany).

THEORY OF SEMICLASSICAL APPROXIMATION AND ITS APPLICATION IN HEAVY ION COLLISIONS.
D. H. E. Gross. Oct 73, 65p
U.S. Sales Only.

Descriptors: (*Ion collisions, *Semiclassical approximation), Elastic scattering, Heavy ion reactions, Heavy ions, Inelastic scattering, Rutherford scattering.

For abstract, see NSA 29 05, number 11172.

JINR-P12-7447 PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Reactions.
EXPRESS INSTRUMENTAL-ACTIVATION DETERMINATION OF HALIDES AND MERCURY BY /SUP 199M/HG ISOMER.
I. Duda. 1973, 20p
In Russian. U.S. Sales Only.

Descriptors: (*Mercury, *Activation analysis), (*Chlorine, Activation analysis), (*Fluorine, Activation analysis), (*Bromine, Activation analysis), Iodine, Neutron reactions, Quantitative chemical analysis, Sensitivity.

For abstract, see NSA 29 05, number 09761.

JINR-P2-7530 PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
PROTON STRUCTURE AND THE FINE SPLITTING IN THE HYDROGEN ATOM.
N. E. Nyunko, Yu. N. Tyukhtyaev, and R. N. Faustov. 1973, 12p
In Russian. U.S. Sales Only.

Descriptors: (*Protons, *Particle structure), (*Hydrogen, *Fine structure), Atoms, Energy levels.

For abstract, see NSA 29 05, number 11162.

LBL-1816 PC$14.00/MF$1.45
California Univ., Berkeley (Usa). Lawrence Berkeley Lab.
LOW ENERGY ELECTRON DIFFRACTION AND WORK FUNCTION STUDIES OF ADSORBED ORGANIC LAYERS ON THE (100) AND (111) CRYSTAL SURFACES OF PLATINUM.
J. L. Gland. Sep 73, 237p
Contract W-7405-eng-48

Descriptors: (*Platinum, *Surface properties), (*Organic compounds, *Adsorption), Chemical bonds, Electric charges, Electron diffraction, Surfaces, Work functions.

For abstract, see NSA 29 05, number 12469.

LYCEN-7307 PC$7.00/MF$1.45
EXTRACTION OF FLUORIDES WITH THE HELP OF SEVERAL ORGANIC ANTIMONY DERIVATIVES.
C. Martelet. Mar 73, 98p
In French. U.S. Sales Only.

Descriptors: (*Fluorides, *Solvent extraction), Antimony compounds, Fluorine, Hydrolysis, Hydroxides, Organometallic compounds, Tracer techniques.

For abstract, see NSA 29 05, number 12471.

NLCO-1105 PC$4.00/MF$1.45
National Lead CO. Of Ohio, Cincinnati (Usa).
SPECTROCHEMICAL DETERMINATION OF 1 PPM OF TA AND W IN U SUB 3 O SUB 8 USING A CARRIER DISTILLATION METHOD.
C. E. Pepper, and G. R. Blank. Nov 73, 12p
Contract AT(30-1)-1156

Descriptors: (*Tantalum, *Spectroscopy), (*Tungsten, Spectroscopy), (*Uranium oxides u3o8, *Quantitative chemical analysis), (*U3o8, Quantitative chemical analysis), Antimony, Carriers, Distillation, Impurities, Molybdenum, Niobium, Titanium, Vanadium.

For abstract, see NSA 29 05, number 09803.

N74-14863/6GA PC$3.75/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
QUANTITATION AND DETECTION OF VANADIUM IN BIOLOGIC AND POLLUTION MATERIALS.
W. A. Gordon. Jan 74, 34p NASA-TM-X-71497, E-7853

Descriptors: *Air pollution, *Biological effects, *Trace elements, *Vanadium, Detection, Procedures, Quantitative analysis.

For abstract, see STAR 1206

N74-14865/1GA PC$3.25/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
ON THE STRUCTURE OF PHOSPHORUS COMPOUNDS.
R. Wolf. Jan 74, 22p NASA-TT-F-15282
Contract NASW-2481
Tran-Transl. Into English from Decouverte (France), Dec. 1972 p 4-11.

Descriptors: *Bonding, *Organic chemistry, *Organic phosphorus compounds, Chemical bonds, Phosphorus, Structural analysis, Valence.

For abstract, see STAR 1206

N74-15209/1GA PC$2.75/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SLIDING OF POLY(VINYL CHLORIDE) ON METALS STUDIED BY AUGER ELECTRON SPECTROSCOPY.
S. V. Pepper. Jan 74, 24p NASA-TN-D-7533, E-7469

Descriptors: *Auger effect, *Iron, *Nickel, *Polyvinyl chloride, *Sliding friction, Chemisorption, Chlorine, Hydrochloric acid, Thermal degradation.

For abstract, see STAR 1206

N74-15283/6GA PC$3.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
ELECTRODE POLARIZATION IN FUSED SILICATES AND THE FORMATION OF BIVALENT SILICON.
O. A. Yesin, and L. K. Gavrilov. Jan 74, 10p
NASA-TT-F-15264
Contract NASW-2483
Tran-Transl. Into English from Zh. Fiz. Khim. (Moscow), V. 30, No. 2, 1956 p 374-378.

Descriptors: *Electrodes, *Silicates, *Silicon compounds, Electrolytes, Oxides, Phosphorus compounds, Polarization (Charge separation).

For abstract, see STAR 1206

N74-15285/1GA PC$3.00/MF$1.45
Interuniversitair Reactor Instituut, Delft (Netherlands).
THE FLATTENING OF OIL DROPLETS ON A GLASS PLATE DE AFPLATTING VAN OLIEDRUPPELTJES OP EEN GLASPLAAT.
F. C. Vanbeukering, A. Vantriet, and G. A. Ferron. Sep 73, 9p IRI-190-73-01
Language in Dutch.

Descriptors: *Aerosols, *Flattening, *Oils, *Precipitation particle measurement, Centrifuges, Evaporation rate, Industrial plants, Particle size distribution, Spirals (Concentrators).

For abstract, see STAR 1206

N74-15412/1GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
RADIATIVE TRANSITIONS INVOLVING THE (2P2)(3 PE) METASTABLE AUTODETACHING OF H(-).
V. L. Jacobs, A. K. Bhatia, and A. Temkin. Jan 74, 18p NASA-TM-X-70570, X-602-74-13
Subm-Submitted for Publication.

Descriptors: *Absorptivity, *Boundary layer transition, *Stellar atmospheres, Absorption spectra, Emission spectra, Lyman alpha radiation, Metastable state, Photons, Wave functions.

For abstract, see STAR 1206

N74-15657/1GA PC$3.00/MF$1.45
North Carolina State Univ., Raleigh.
THERMODYNAMIC PROPERTIES OF UF6 AT HIGH TEMPERATURES.
H. A. Hassan, and J. E. Deese. Jan 74, 36p NASA-CR-2373
Contract NGR-34-002-177

Descriptors: *Thermodynamic properties, *Uranium fluorides, Controlled atmospheres, Decomposition, High temperature, Thermodynamics.

For abstract, see STAR 1206

PATENT-3 140 148 Not available NTIS
Department of the Interior, Washington, D.C.
METHOD OF TREATING EXHAUST GASES WITH URANIA-CONTAINING CATALYSTS.
Patent,
Lawrence J. E. Hofer, and Robert B. Anderson.
Filed 26 Jul 61, patented 7 Jul 64, 3p PAT-APPL-127 066,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Exhaust gases, *Oxidation, *Air pollution control, *Uranium oxides, Catalysts.
Identifiers: PAT-CL-23-2, Automobile exhaust, *Catalytic reactors(Exhaust systems).

Internal combustion exhaust gas, particularly the exhaust gas from automobiles, is believed to be an important contribution to air pollution. The object of this invention is to provide a simple, effective and economical method for the oxidation of hydrocarbons and partially oxygenated compounds in exhaust gas and fumes at a reasonable temperature to produce harmless products. This is done by employinga catalyst comprising urania on an inert carrier having chromia and copper oxide as activators.

PATENT-3 397 040 Not available NTIS
Department of the Interior, Washington, D.C.
SPECTROPHOTOMETRIC METHOD FOR THE DETERMINATION OF GOLD.
Patent,
Hubert W. Lakin, and Harry M. Nakagawa. Filed 28 Feb 66, patented 13 Aug 68, 3p PAT-APPL-532 533, DOCKET/SUR-894
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Spectroscopic analysis, *Gold, *Patents.
Identifiers: PAT-CL-23-230.

Present gold determination methods enployed during prospecting and studies of the chemical composition of the earth's crust either involve expen-

sive equipment or are slow and tedious. The object of the present invention is to provide an inexpensive method sensitive to the presence of minute quanities of gold in the geologic sample being tested, which method is highly suitable for field applications. The process is as follows: A geologic sample is initially ground to a powder. After roasting the ground sample to burn off organic materials and to volatilize certain elements such as mercury and selenium, it is contacted with a concentrated hydrobromic acid-bromine solution which dissolves elemental gold and gold compounds present in the sample. Pregnant acid solution resulting from the hydrobromic acid dissolution step is diluted with water and then mixed with ethyl ether which is capable of extracting the gold present therein. After other steps, the ether solution is completely evaportated, and the solid residue is dissolved in dilute ammonium acetate or nitrilo triacetic acid; and 4,4' - bis(dimethylamino)thiobenzophenone (thio-Michler's ketone; TMK) in an organic carrier solvent such as isoamyl alcohol is added thereto to yield a solution with a red color whose intensity is proportional to the amount of gold present.

PATENT-3 482 635 Not available NTIS
Department of the Interior, Washington, D.C.
POLYACRYLAMIDE REMOVAL FROM POROUS MEDIA.
Patent,
Joseph Pasini, III. Filed 6 Mar 67, patented 9 Dec 69, 3p PAT-APPL-621 408, DOCKET/MIN-1145
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Polyacrylamides, Dissolving, Oil recovery.
Identifiers: PAT-CL-166-305.

Solutions of polyacrylamide in water or brine are commonly used in the petroleum industry to enhance the secondary recovery of crude oil during waterflooding, by impeding the flow of water or gas through 'loose streaks' in gas repressuring or storage operations and to control flow through reservoirs under similar conditions. These same solutions are also used to simulate field conditions on laboratory cores. In either case, it is often desirable to remove the polymer from the porous formation to increase permeability and allow other types of recovery techniques to be carried out such as waterflooding or thermal operations. The patent describes a process in which polyacrylamide is removed from porous media by treatment with alkaline solution.

PATENT-3 715 910 Not available NTIS
Department of Agriculture, Washington, D.C.
DETERMINATION OF RESIDUAL SOLVENT IN OILSEED MEALS AND FLOURS BY A VOLATILIZATION PROCEDURE.
Patent,
Sara P. Fore, Eric T. Rayner, and Harold P. Dupuy. Filed 26 Jan 71, patented 13 Feb 73, 6p PAT-APPL-109 883,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Oilseeds, *Impurities, Flours(Food), Gas chromatography.
Identifiers: PAT-CL-73-23-1.

In experiments to identify the factor or factors that impart off flavors to cottonseed meals and flours prepared by extraction with a mixture of acetone, hexane and water (AHW), it was necessary to determine the concentration of residual hexane and acetone which might be present in the oilseed meals. In general, the procedure of the patent consists of the following: A sample of oilseed meal or flour is weighed into a serum bottle together with a small volume of water. An internal standard such as ethanol or methanol can conveniently be added to the water which is incorporated to accelerate the volatilization of the residual solvent. The serum bottle is sealed with a syringe penetrable rubber stopper and heated in an oven for a specified period to volatilize the residual solvent present in the meal or flour. An aliquot of the headspace gas is then analyzed by gas chromatography.

PATENT-3 731 466 Not available NTIS
Department of Agriculture, Washington, D.C.
CONTINUOUS FLOW MULTIPLE TRAP FOR LOW TEMPERATURE REDUCED PRESSURE GAS CHROMATOGRAPHY.
Patent,
Chester K. Kunsman, and Richard I. Coleman. Filed 14 Jul 71, patented 8 May 73, 8p PAT-APPL-162 461,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Gas chromatography, Traps.
Identifiers: PAT-CL-55-386.

This invention relates to a gas chromatography trap for low temperature, reduced pressure, gas chromatography device. This device prevents the potential breakdown of compounds by not subjecting these to high temperatures and pressures.

PB-227 874/5GA PC$4.00/MF$1.45
North Carolina Water Resources Research Inst., Raleigh.
DETERMINATION OF THE COMPLEXING CAPACITY OF NATURAL WATER,
Kenneth W. Hanck, and James W. Dillard. Dec 73, 87p* 85 W74-04312, OWRR-A-052-NC(1)
Contract DI-14-31-0001-3533

Descriptors: *Complex compounds, *Hydration, *Water chemistry, Measurement, Trace elements, Volumetric analysis, Polarographic analysis, Reaction kinetics, Cobalt, pH.
Identifiers: Voltammetry.

An analytical procedure for chemically measuring the complexing capacity (ability of a water to complex metal ions) of natural water is developed and tested. The procedure can be used in evaluating the role of natural complexing agents in the transport, toxicity, and availability of trace metal ions in natural waters. Three methods were evaluated, two based on micro scale complexometric titration using anodic stripping voltammetry, and a third, the recommended procedure, involving chemical conversion of the ligands (substances capable of forming metal complexes with metal ions) in the sample to the corresponding cobalt (III) complex. Differential pulse polarography was used to monitor the decreases in cobalt (III) concentration after production of the cobalt (III) complexes and hence the complexing capacity of the sample. This procedure has a detection limit of 0.6 micromoles of ligand per liter.

PB-227 966/9GA PC$4.00/MF$1.45
National Center for Energy Management and Power, Philadelphia, Pa.
THERMOCHEMISTRY OF SALT HYDRATES.
Technical rept.,
Geoffrey Belton, and Fouad Ajami. May 73, 98p* NSF-RA/N-73-079, NSF-RANN/SE/GI-27976/TR-73-4
Grant NSF-GI-27876
Report on Conservation and Better Utilization of Electric Power by Meansof Thermal Energy Storage and Solar Heating.

Descriptors: *Thermochemical properties, *Inorganic salts, *Hydrates, *Solar energy concentrators, Water, Phase diagrams, Criteria, Supercooling, Heat of fusion, Corrosion, Crystal growth, Melting, Solification.

This report describes research performed on materials suitable for thermal energy storage (TES) applied to solar heating and air conditioning of buildings. Criteria for candidate materials are developed, and the various classes of materials that undergo a phase transformation at the required temperatures are briefly reviewed in that light. Most of the report, then, concentrates on one class of materials: inorganic salt hydrates. An extensive literature survey on phase diagrams and thermodynamic properties of salt hydrates was carried out. The kinetics of nucleation of the solid from the melt are considered from the theoretical point of view, since past studies indicated that supercooling is a serious problem in these materials. It is found that salt hydrates are half-way between the good glass formers (which strongly supercool) and the non-glass formers (which do not supercool); as a result, it is suggested that the use of outside agents, such as a small weak supersonic field, may prevent supercooling. (Modified author abstract)

PB-228 006/3GA PC$3.25/MF$1.45
Stanford Research Inst., Menlo Park, Calif.
POLLUTION-FREE ELECTROCHEMICAL POWER GENERATION FROM LOW GRADE COAL,
D. F. McMillen, R. D. Weaver, and M. Anbar. Aug 73, 50p* NSF-RA/N-73-0108
Grant NSF-GI-34027

Descriptors: *Electrochemical power generation, *Electric power generation, *Coal, *Fused salts, Carbonates, Lead oxide, Reduction(Chemistry), Air pollution control, Efficiency, Performance evaluation, Reaction kinetics, Electrochemistry, Coke, Sulfur.
Identifiers: Coal(High sulfur).

The report describes the results of a study, exploring the feasibility of a nonpolluting, combined chemical-electrochemical system for generating electrical power. The process entails the use of coal to reduce lead oxide to a lead in a molten carbonate medium. The lead contained in the molten carbonate is then used in a metal air electrochemical cell to generate electrical power. To date it has been demonstrated that: Reduction of lead oxide by solid petroleum coke in a molten sodium-lithium-potassium carbonate eutectic is a two-step process whose overall rate is generally limited by the rate of reaction of solid carbon with CO2. The rate of this latter reaction, in turn, is directly proportional to the external surface area of the coke. Under these conditions temperature dependence of the overall process provides an apparent activation energy of about 35 kcal/mole over the temperature range 530 to 650C. Extrapolation of the results indicates that the feasibility of the concept will not be limited by the kinetics of PbO reduction only the kinetics of electro-chemical lead oxidation, and indicates that the system could be capable of producing electrical power from coal at 3.4 kWh on the basis of a fuel cost of $10 per ton; i.e., with an overall efficiency of 42%. (Modified author abstract)

RISO-M-1610 PC$8.75/MF$1.45
Danish Atomic Energy Commission, Risoe. Research Establishment.
RADIOISOTOPE-EXCITED X-RAY FLUORESCENCE ANALYSIS AND ITS APPLICATION TO GEOCHEMICAL EXPLORATION IN GREENLAND.
H. Kunzendorf. May 73, 133p
In German. U.S. Sales Only.

Descriptors: (*Chromium, *X-ray fluorescence analysis), (*Nickel, X-ray fluorescence analysis), (*Copper, X-ray fluorescence analysis), (*Zinc, X-ray fluorescence analysis), Accuracy, Cerium, Geochemistry, Grain size, Lanthanum, Lead, Molybdenum, Neodymium, Niobium, Proportional counters, Quantitative chemical analysis, Rocks, Rubidium, Scintillation counters, Sediments, Semiconductor detectors, Sensitivity, Strontium, Titanium, Zirconium.

For abstract, see NSA 29 05, number 09830.

USIP-73-15 PC$3.75/MF$1.45
Stockholm Univ. (Sweden). Fysiska Institutionen.
SOME INTEGRAL STUDIES OF AIR BUBBLES IN WATER DUCTS.
A. J. W. Andersson. Oct 73, 33p
U.S. Sales Only.

Descriptors: (*Water, *Boiling), Air, Bubbles, Ducts, Fuel assemblies, Simulation, Temperature dependence, Void fraction.

For abstract, see NSA 29 05, number 10071.

7E. Radio and Radiation Chemistry

AD-775 470/8GA PC$3.00/MF$1.45
Georgia Univ Athens Dept of Chemistry
CHEMISTRY OF EXCITED STATES.
Final rept.,
David M. Hercules. 17 Dec 73, 24p AROD-8628.6-C
Grant DA-ARO-D-31-124-70-G67

Descriptors: *Chemiluminescence, Phenols, Fluorescence, Excitation, Photolysis, Photochemical reactions, Phosphorescence, Molecular energy levels, Hydrazides, Phthalic acids, Scientific research, Quenching(Inhibition).
Identifiers: *Rearrangement reactions, Anthraquinones, Chemical reaction mechanisms.

The photoreduction of anthraquinone was studied and spectro obtained. The Photo-Fries rearrangement was studied. The chemiluminescence of luminol in dimethylsulfoxide and dimethylsulfoxide-water systems was studied. The chemiluminescence of luminol in water was investigated, particularly the role of catalysts and oxidizing agents other than hydrogen peroxide. A detailed mechanism of the luminolodine system is presented. Chemiluminescence from radical ion-peroxide reactions was studied: Electrochemiluminescence from energy sufficient and energy deficient systems was studied. The effects of quenching and inert gases on ECL processes was studied and the mechanism of this quenching investigated. (Modified author abstract)

BNWL-SA-4763 PC$3.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
ELECTRON EJECTION CROSS SECTIONS FOR HYDROCARBON MOLECULES AND THEIR IMPLICATIONS FOR PHASE EFFECTS.
W. E. Wilson, and H. G. Paretzke. 10p CONF-730952-5
Contract AT(45-1)-1830

Descriptors: (*Methane, *Proton transport), (*Ethane, Proton transport), (*Ethylene, Proton transport), (*Benzene, Proton transport), Acetylene, Cross sections, Electron emission, Hydrogen, Kev range 100-1000, Mev range 01-10, Phase transformations.

For abstract, see NSA 29 05, number 11678.

COO-2190-11 PC$3.00/MF$1.45
Utah Univ., Salt Lake City (Usa).
DYNAMICS AND MECHANISMS OF HOT CHEMISTRY STIMULATED BY RECOIL METHODS (GAS PHASE STUDIES OF THE KINETICS AND MECHANISM OF HIGH ENERGY SULFUR ATOM REACTIONS AND SOME NOVEL ASPECTS OF HOT HALOGEN REACTIONS). PROGRESS REPORT, MARCH 1, 1973--FEBRUARY 28, 1974.
L. D. Spicer. 1973, 17p
Contract AT(11-1)-2190

Descriptors: (*Hot atom chemistry, *Research programs), (*Sulfur, Hot atom chemistry), (*Chlorine, Hot atom chemistry), Chemical reactions, Energy transfer, Gases, Hydrogen, Recoils.

For abstract, see NSA 29 05, number 09962.

COO-3118-4 PC$3.75/MF$1.45
Brandeis Univ., Waltham, Mass. (Usa). Dept. Of Chemistry.
EFFECTS OF MERCAPTANS AND DISULFIDES ON PHOTOCHEMICAL AND HIGH ENERGY RADIATION INDUCED REACTIONS. PROGRESS REPORT, NOVEMBER 1, 1972--OCTOBER 31, 1973.
S. G. Cohen. 1973, 31p
Contract AT(11-1)-3118

Descriptors: (*Acetic acid esters, *Radiolysis), (*Hydroxyl radicals, *Chemical reactions), (*Hydrogen, Chemical reactions), (*Solvated electrons, Chemical reactions), Aqueous solutions, Atoms, Formic acid, Hydrogen peroxide, Photochemistry, Radiation chemistry, Research programs, Thiols.

For abstract, see NSA 29 05, number 09908.

COO-3373-10 PC$3.00/MF$1.45
New England Inst., Inc., Ridgefield, Conn. (Usa).
DETECTION OF PHASE TRANSITIONS IN MOLECULAR CRYSTALS AND MACROMOLECULAR SUBSTANCES BY POSITRON ANNIHILATION.
S. Y. Chuang, and S. J. Tao. Jan 74, 18p CONF-730561-2
Contract AT(11-1)-3373

Descriptors: (*Positrons, *Annihilation), (*Crystals, Positrons), (*Methanol, Positrons), (*Alkanes, Positrons), Lifetime, Liquids, Phase transformations, Polyethylene glycols, Solids, Temperature dependence, Thiols.

For abstract, see NSA 29 05, number 11165.

JINR-E12-7547 PC$3.50/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Reactions.
STUDIES OF THE HEAVIEST ELEMENTS AT DUBNA.
I. Zvara. 1973, 28p CONF-730927-4
U.S. Sales Only.

Descriptors: (*Element 104 compounds, *Volatility), (*Element 105 compounds, Volatility), (*Transuranium compounds, Volatility), Gas chromatography, Halides, Trans 104 elements.

For abstract, see NSA 29 05, number 09968.

JINR-P12-7423 PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Problems.
ROLE OF TRANSFER OF PIONS IN SUPPRESSION OF PI EXP - MESON CAPTURE BY BOUND HYDROGEN.
V. I. Petrukhin, V. E. Risin, and V. M. Suvorov. 1973, 12p
In Russian. U.S. Sales Only.

Descriptors: (*Hydrogen, *Mesic molecules), Molecules, Pionic atoms, Pions minus.

For abstract, see NSA 29 05, number 11166.

N74-15289/3GA PC$3.75/MF$1.45
Office National d'Etudes et de Recherches Aerospatiales, Toulouse (France). Dept. d'Etudes et de Recherches en Technologie Spatiale.
RADIATION INDUCED DEGRADATION MECHANISMS IN POLYMERS LES MECANISMES DE DEGRADATION SOUS RAYONNEMENTS DANS LES POLYMERES.
A. Paillous. Oct 73, 31p ONERA-DERTS-NT-03-9
Language in French.

Descriptors: *Degradation, *Polymers, *Radiation damage, *Space environment simulation, Aging (Materials), Electron irradiation, Ionizing radiation, Molecular excitation, Optical properties, Proton irradiation, Ultraviolet radiation.

For abstract, see STAR 1206

ORNL-TM-4403 PC$5.25/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
TESTS OF THE STABILITY OF DOWTHERM A AT 600 EXP 0 F WITH RADIATION DOSES UP TO 10 EXP 6 RAD.
A. M. Smith. Jan 74, 65p
Contract W-7405-eng-26

Descriptors: (*Biphenyl, *Chemical radiation effects), (*Ethers, Chemical radiation effects), Capsules, Gamma radiation, Gases, High temperature, Power plants, Radiation doses, Rankine cycle, Stability.

For abstract, see NSA 29 05, number 09911.

ORO-1797-45 PC$3.00/MF$1.45
Florida State Univ., Tallahassee (Usa). Dept. Of Chemistry.
KINETICS OF EXCHANGE OF TRIVALENT ACTINIDE IONS WITH EUROPIUM ETHYLENEDIAMINETETRAACETATE.
K. R. Williams, and G. R. Choppin. 1973, 15p

Descriptors: (*Europium complexes, *Kinetics), (*Curium compounds, Kinetics), (*Berkelium compounds, Kinetics), (*Californium compounds, Kinetics), Acetates, Actinides, Aqueous solutions, Berkelium complexes, Berkelium 249, Buffers, Californium complexes, Californium 252, Cations, Chemical reactions, Curium complexes, Curium 244, Edta, Ph value.

For abstract, see NSA 29 05, number 09969.

ORO-2001-29 PC$3.00/MF$1.45
Florida State Univ., Tallahassee (Usa).
RADIATION INDUCED EFFECTS IN ORGANIC SYSTEMS. PROGRESS REPORT, DECEMBER 1, 1972--DECEMBER 1, 1973.
R. H. Johnsen. 1973, 14p
Contract AT(40-1)-2001

Descriptors: (*Radiation chemistry, *Research programs), (*Organic compounds, Radiation chemistry), (*Ethers, *Radiolysis), (*Organic nitrogen compounds, Radiolysis), Amino acids, Radicals, G value, Reaction kinetics, Chemical reactions, Ions, Metals, Molecules, Surfaces.

For abstract, see NSA 29 05, number 09912.

STU-69-488-U-355 PC$3.50/MF$1.45
Styrelsen Foer Teknisk Utveckling, Stockholm (Sweden).
INTRODUCTORY STUDIES ON THE POSSIBILITIES OF ELIMINATING ODOROUS AIR POLLUTANTS IN KRAFT MILL GASEOUS EFFLUENTS BY IONIZING RADIATION OR ELECTRICAL DISCHARGES.
B. Bjellqvist, T. E. Eriksen, B. Widen, and T. Westermark. Jul 71, 29p
In English and Swedish. U.S. Sales Only.

Descriptors: (*Waste processing, *Radiation chemistry), (*Thiols, *Radiolysis), Accelerators, Air pollution, Catalysis, Cellulose, Cobalt 60, Electron beams, G value, Gamma radiation, Oxidation, Ozone, Paper, Production.

For abstract, see NSA 29 05, number 09913.

TRITA-KKE-7301 PC$8.50/MF$1.45
Kungliga Tekniska Hoegskolan, Stockholm (Sweden). Institutionen Foer Kaernkemi.
REPORT TO THE SWEDISH ATOMIC RESEARCH COUNCIL, 1972.
Jan 73, 130p
In Swedish and English. U.S. Sales Only.

Descriptors: (*Radiation chemistry, *Research programs), Leading abstract, National organizations, Sweden.

For abstract, see NSA 29 05, number 09914.

8. EARTH SCIENCES AND OCEANOGRAPHY

8A. Biological Oceanography

AD-775 343/7GA Reprint
Woods Hole Oceanographic Institution Mass
'BIREMIS BLANDI' (POLYCHAETA: TEREBELLIDAE), NEW GENUS, NEW SPECIES, CAUGHT BY D.S.R.V. 'ALVIN' IN THE TONGUE OF THE OCEAN, NEW PROVIDENCE, BAHAMAS.
Technical rept.,
P. T. Polloni, G. T. Rowe, and J. M. Teal. 15 Feb 73, 11p Rept nos. WHOI-73-60, WHOI-Contrib-2891
Contracts N00014-66-C-0241, N00014-71-C-0284
Sponsored in part by Grant NSF-GA-31235.
Availability: Pub. in Marine Biology, v20 p170-175 1973.

Descriptors: *Annelida, *Bahama Islands, *Atlantic Ocean, Classification, Identification.
Identifiers: Tongue of the Ocean, *Biremis blandi, Polychaeta.

Biremis, n. gen., characterized by an enlarged cephalic lobe, achaetous thoracic segments, and abdominal bilobed uncinigerous pinnules, lacks eyes and branchiae and is, thus, grouped with the subfamily Polycirrinae of the Terebellidae. Biremis blandi, n. sp., has prominent longitudinal muscular ventral ridges, lacking ventral glandular scutes. The avicular uncini, arranged in a single row on each lobe of each abdominal pinnule, are very similar to those of Polycirrus. The new species, collected from D.S.R.V. 'Alvin', was observed resting on and swimming over the sloping walls of the Tongue of the Ocean. (Modified author abstract)

AD-775 348/6GA Reprint
Woods Hole Oceanographic Institution Mass
ALKANES AND ALKENES IN MARINE BENTHIC ALGAE,
W. W. Youngblood, and M. Blumer. 6 Apr 73, 14p Rept nos. WHOI-73-88, WHOI-Contrib-3155
Contract N00014-66-C-0251, Grant NSF-GA-19472
Sponsored in part by Grant NSF-GA-35646. Prepared in cooperation with Florida Technological Univ., Orlando. Dept. of Chemistry.
Availability: Pub. in Marine Biology, v21 n3 p163-172 1973.

Descriptors: *Algae, *Aquatic plants, *Hydrocarbons, Marine biology, Alkanes, Alkenes, Chemical analysis, Gas chromatography, Mass spectrometry.

Saturated and olefinic hydrocarbons were determined in additional species of benthic marine algae from the Cape Cod Massachusetts area. The distribution of homologous and isomeric olefins was studied in plants of different age and in morphologically different parts of the same specimen. With two minor exceptions, only normal alkanes and alkenes are present. The methylene-interrupted C19- and C21-polyolefins are particularly abundant; Delta 1-heneicosahexaene and the correseponding pentaene are common to all brown algae while the corresponding delta 3-isomers occur in green algae. The hydrocarbon concentration, the alkene-to-alkane ratio and the polyolefin content are highest in young plants or in rapidly growing tissues of older plants. The biosynthesis of the plant polyolefins remains to be explored. The hydrocarbon composition of these benthic algae differs greatly from that of fossil fuels in its simplicity and predominantly unsaturated nature. (Modified author abstract)

COM-74-10454/8GA PC$3.00/MF$1.45
Oregon State Univ., Corvallis. Sea Grant Marine Advisory Program.
PHYTOPLANKTON GRASS OF THE SEA,
Herbert Curl, Jr. Dec 73, 6p OSU-SG-9 NOAA-74012306

Descriptors: *Phytoplankton, *Sea grasses, *Marine biology, Abundance, Photosynthesis, Carbon dioxide, Plankton blooms, Marine fishes, Aquatic plants, Upwelling, Oregon, Coasts.
Identifiers: Sea Grant program.

Nearly everything that lives in the sea and much that lives on the land depends for its existence on phytoplankton, the most abundant plants in the world. From carbon dioxide and water, by photosynthesis, they produce more organic matter than any other plants and they release amounts of oxygen proportional to the carbon dioxide they use. Without this production, not only would there not be any food for grazing and filter feeding animals in the ocean but there would be no fish, which feed on the smaller grazers. In Oregon coastal waters, massive phytoplankton growths, called blooms, occur when cold, nutrient-rich water is brought to the surface from depths of 300 feet or more.

COM-74-10488/6GA Reprint
National Marine Fisheries Service, Seattle, Wash. Northwest Fisheries Center.
PARAFFIN HYDROCARBON PATTERNS IN PETROLEUM-POLLUTED MUSSELS,
Robert C. Clark, Jr., and John S. Finley. 1973, 7p NOAA-74012810
Pub. in Marine Pollution Bull. p172-176 n.d.

Descriptors: *Water pollution, *Mussels, *Shellfish, Chemical analysis, Crude oil, Petroleum, Hydrocarbons, Mollusca, Aquatic animals, Absorption.
Identifiers: *Oil pollution, Water pollution effects(Animals).

By applying modern analytical chemistry techniques to the problem of oil pollution in the marine environment, it is possible to detect very low levels of paraffin hydrocarbons in intertidal marine organisms and to use these compounds with suitable baseline information for estimating the quantity of petroleum pollution uptake in the organisms. Under conditions of moderate to major oil pollution, this technique provides a calculation of residual paraffin hydrocarbon pattern in exposed organisms which can be compared to the pollutant hydrocarbon pattern. For low-level persistent pollution, the use of paraffin hydrocarbon patterns and content can often provide an indication of petroleum uptake but, in cases where the pollutant is low in paraffin hydrocarbons (lubricating oils, some crude oils, etc.) or where the rate of bacterial degradation is equivalent to the pollutant input, different techniques of analysis are required. (Author)

N74-15061/6GA PC$3.50/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
DETECTION OF OCEAN COLOR CHANGES FROM HIGH ALTITUDES.
W. A. Hovis, M. L. Forman, and L. R. Blaine. Nov 73, 30p NASA-TM-X-70559, X-652-73-371
Subm-Submitted for Publication.

Descriptors: *Chlorophylls, *Color, *Oceanography, *Sea water, Atmospheric scattering, High altitude, Lear jet aircraft, Low altitude.

For abstract, see STAR 1206

8B. Cartography

AD-775 271/0GA Not available NTIS
New Brunswick Univ Fredericton
ORIENTATION OF CONTINUOUS-STRIP IMAGERY,
Eugene E. Derenyi. 1973, 10p
Availability: Pub. in Photogrammetric Engineering, p1329-1338 1973.

Descriptors: *Stereophotogrammetry, *Photointerpretation, Continuous strip cameras, Side looking radar, Infrared scanning, Line scanning, Canada.

Three schemes are suggested for the relative orientation of continuous-strip imageries produced by stereo systems: (1) Line-to-line orientation method, in which two lines of corresponding points are oriented relatively; (2) Section-to-section method, in which the strip is subdivided into sections and it is assumed that orientation elements remain constant within such a section; and (3) Triple-channel recording scheme which presupposes that three sets of images are recorded simultaneously, one of which is a vertical view of the terrain and the other two are taken at diverging angles. The third scheme provides the most promising solution; however, an appropriate sensor package needs to be designed and constructed. (Author)

AD-775 544/0GA PC$3.25/MF$1.45
Wisconsin Univ Madison Dept of Geography
THE ACCURACY OF ISOMETRIC MAPS.
Final rept. 1 Jan 71-31 Aug 73,
Joel L. Morrison. Feb 74, 28p AROD-9450.3-GS
Grant DA-ARO-D-31-124-71-G45

Descriptors: *Mapping, Experimental design, Distribution functions, Sampling, Interpolation, Algorithms.
Identifiers: Isometric maps.

The problem investigated by this research was: For a fixed number and scatter of known data points from a geographical distribution with unknown spatial variation, that automated first-stage interpolation algorithm should a cartographer use to most faithfully map the distribution isarithmically. The conclusions, based on an empirical study, state the most effective first-stage algorithm to use with different levels of numbers of known data points and scatters of known data points.

E74-10315 PC$4.25/MF$1.45
Wisconsin Univ., Madison. Environmental Monitoring and Data Acquisition Group.
EVALUATION OF THE APPLICATION OF ERTS-1 DATA TO THE REGIONAL LAND USE PLANNING PROCESS.
Progress rept.,
James L. Clapp. 1 Feb 74, 25p NASA-CR-136800
Contract NAS5-21754

Descriptors: Wisconsin, Regional planning, Land use, Resources management, Earth resources program, Lakes, Eutrophication, Management planning.

The author has identified the following significant results. Investigators have concentrated on efforts toward assessing the achievements of the current ERTS-1 research so that significant results could be incorporated into the updated version of their ERTS-B research proposal. Significant progress was made in the development of operational mechanisms, linking the research community at the University and the operation agencies of the State of Wisconsin. Efforts have been made to finalize a report which is being prepared for the State of Wisconsin Department of Administration, evaluating the applicability of ERTS-1 to the planning needs of the State of Wisconsin. This document is intended to assess the degree of utility of the satellite for providing information which has been designated by state planners as essential to their needs. This effort is considered highly significant to the overall research program since a situation has been created in which a prime potential user of ERTS type data has been given the opportunity to determine the direction of the research.

N74-15054/1GA PC$4.25/MF$1.45
Institut fuer Angewandte Geodaesie, Frankfurt am Main (West Germany).

CARTOGRAPHIC AND SURVEYING REPORTS. SERIES 1: ORIGINAL STUDIES NACHRICHTEN AUS DEM KARTEN- UND VERMESSUNGSWESEN. REIHE 1: ORIGINAL-BEITRAEGE.
1973, 42p BULL-63
In German; English Summary.

Descriptors: *Aerial photography, *Geodetic surveys, *Light aircraft, Aircraft design, Photogrammetry, Structural design, Tables (Data).

For abstract, see STAR 1206

N74-15055/8GA PC$6.50/MF$1.45
Institut fuer Angewandte Geodaesie, Frankfurt am Main (West Germany).
CARTOGRAPHIC AND SURVEYING REPORTS. SERIES 1: ORIGINAL STUDIES NACHRICHTEN AUS DEM KARTEN- UND VERMESSUNGSWESEN. REIHE 1: ORIGINAL-BEITRAEGE.
1973, 89p BULL-60
In German; English Summary.

Descriptors: *Error analysis, *Photogrammetry, *Photointerpretation, Geomorphology, Mapping, Orthophotography, Topography.

For abstract, see STAR 1206

PATENT-3 164 905 Not available NTIS
Department of the Interior, Washington, D.C.
UNIVERSAL TRACING TABLE.
Patent,
Charles L. Pillmore, and Robert H. Morris. Filed 16 Aug 61, patented 12 Jan 65, 5p PAT-APPL-131 943,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Stereoscopic map platters, *Patents, Photogrammetry.
Identifiers: PAT-CL-33-1, Tracing tables, Cartography.

The invention relates to improvements in a plotting or tracing table having particular utility in photogrammetric apparatus for making contour maps. In an apparatus suitable for this purpose, an arrangement of two stereoscopic projection devices are directed to follow the movement of the tracing table over a surface covered by a contour map, and to produce on a platen of the tracing table, a pair of overlapped images which may be seen as a single three dimensional image by stereoscopic viewing means. A tracing stylus fixed to the tracing table is effective to form the lines of the contour map as the table is moved about.

PATENT-3 464 766 Not available NTIS
Department of the Interior, Washington, D.C.
STEREO-IMAGE ALTERNATOR SYSTEM.
Patent,
Jack William Knauf. Filed 28 Oct 66, patented 2 Sep 69, 17p PAT-APPL-591 057, DOCKET/SUR-912
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Stereoscopic map plotters, *Patents, Optical equipment, Map projection, Eyeglasses.
Identifiers: PAT-CL-353-6.

The patent describes a stereoscopic plotting apparatus having an optical system comprising a pair of image projecting mechanisms for projecting a right eye view and a left eye view upon the same area of a viewing plane. Each projecting mechanism has a shutter and the shutters are synchronized such that the left eye view and the right eye view are alternately projected onto the viewing plane. A viewing apparatus has a shutter mechanism which is synchronized with the shutters of the projecting mechanisms and provides for alternate viewing of the left and right views. An alternate embodiment of a viewing apparatus consists of a pair of glasses on which is mounted a motor driven belt having alternating transparent and opaque areas for alternately blocking the left and right eye views.

PATENT-3 968 869 Not available NTIS
Department of the Interior, Washington, D.C.
PREPARATION OF MAPS.
Patent,
Marvin B. Scher. Filed 30 Nov 56, patented 24 Jan 61, 8p PAT-APPL-625 557, DOCKET/SUR-196
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Mapping, *Patents, Photogrammetry, Aerial photographs, Map editing.
Identifiers: PAT-CL-33-1.

The invention relates to the preparation of maps, more especially to photogrammetric mapping procedures based upon aerial photography. It is an object of the invention to provide a system for achieving the satisfactory scale solutions in photogrammetric mapping procedures which require less horizontal control positions than in systems heretofore used. Another object of the invention isto reduce the cost and time of preparation of satisfactory maps.

8C. Dynamic Oceanography

AD-774 766/0GA PC$4.50/MF$1.45
Physical Dynamics Inc Berkeley Calif
A SPECTRAL TRANSFER MODEL OF OCEAN WAVE SPECTRA. I. FORMULATION.
Technical rept.,
J. Alex Thomson, and Bruce J. West. May 73, 103p Rept no. PD-72-029 RADC-TR-73-192
Contract F30602-72-C-0494, ARPA Order-1649

Descriptors: *Ocean waves, Mathematical models, Ocean currents, Internal waves, Surface waves, Interactions, Energy transfer, Wind.

A one-dimensional spectral transfer equation is developed for ocean surface waves in the presence of non-uniform surface currents. The formalism is phenomenological and includes several parameters which are determined by comparison with data. The model contains phenomenological descriptions of wave breaking, wind generation and amplification, radiation stress, viscous damping, capillary effects, wave-wave interaction, nonlinear wave group velocities and convective and refraction terms. The free parameters are determined by fitting the model to the Pierson-Stacy representation of a fully developed sea. Numerical calculations are carried out following wave packets along trajectories in k,x space. The effects of wave reflections and trappings by moving current patterns are included. (Author)

AD-774 902/1GA PC$3.25/MF$1.45
New Hampshire Univ Durham Jackson Estuarine Lab
THE EFFECT OF BOAT WAVES ON THE SEDIMENTARY PROCESSES OF A NEW ENGLAND TIDAL FLAT.
Technical rept. no. 1, Jun-Aug 72,
Franz E. Anderson. 1 Feb 74, 44p
Contract N00014-67-A-0158-0007

Descriptors: *Estuaries, *Sediments, *Erosion, Water waves, Boats, Tides, New Hampshire.
Identifiers: *Suspended sediments.

In order to estimate the effect of increased boat traffic on channel bank and tidal flat erosion, a system of intake valves was 'plumbed' into a portion of a tidal flat in the Great Bay Estuary of New Hampshire. Waves were set up from six different boats, ranging in size from 13 to 34 feet. Water samples were collected from 8 stations orthogonally spaced over the tidal flat. At each station, water samples at 30 and 15 cm off the bottom were collected before, during and after the boat wave passed by and filtered for total suspended load. The boat wave characteristics were measured, along with the bottom currents, salinity, near bottom temperatures, and temperature profiles of the water column. Boat waves were set up at the beginning of the flood phase and near the end of the ebb. These waves were set up at the same water depth for each phase of the tide. (Modified author abstract)

AD-774 915/3GA PC$6.75/MF$1.45
Virginia Univ Charlottesville Dept of Environmental Sciences
AN INTEGRATED MODEL OF STORM-GENERATED WAVES.
Technical rept.,
Donald T. Resio, and Bruce P. Hayden. Dec 73, 276p Rept no. TR-8
Contract N00014-69-A-0060-0006

Descriptors: *Air water interactions, *Ocean waves, Mathematical models, Forecasting, Atlantic Ocean, Coastal regions, Beaches, Atmospheric circulation, Storms, Computer programming.
Identifiers: Storm surges, Beach erosion, BREAKER computer program.

A model which synthesizes large-, synoptic- and small-scale atmospheric motions is developed to investigate several attributes of coastal wave climates. A statistical treatment of storm frequencies over a set of tracks is combined with theoretical models for wave and surf generation. Results indicate highly significant secular and seasonal variations in large-scale circulation patterns. Associated with the large-scale changes are changes in storm frequency of 20% or more along some tracks. For three test sites along the east coast, such variations in storm activity are found to produce marked seasonal and secular changes in the wave-surge climate, primarily in extreme conditions. (Author)

AD-774 974/0GA Reprint
Woods Hole Oceanographic Institution Mass
EFFECTS OF NON-LINEARITIES OF CURRENT METER COMPASSES.
Technical rept.,
W. J. Gould. 1 Nov 72, 8p Rept nos. WHOI-74-2, WHOI-Contrib-2933
Contract N00014-66-C-0241
Availability: Pub. in Deep-Sea Research, v20 n423-427 1973.

Descriptors: *Oceanographic equipment, *Ocean currents, Errors, Orientation(Direction).

The paper draws attention to the errors produced in estimates of residual current due to departures from linearity of current direction sensors. Such effects may be considerable and might significantly alter conclusions made concerning the mean circulation patterns derived from moored current meter arrays deployed in areas of strong tidal/inertial currents. The errors introduced by such non-linearities amount to approximately 1% of the mean scalar speed per degree of compass non-linearity. (Author)

AD-775 028/4GA PC$6.75/MF$1.45
Naval Postgraduate School Monterey Calif
A STUDY OF THE EFFECT OF INTERNAL WAVE INDUCED TURBULENCE ON SMALL SCALE TEMPERATURE STRUCTURE IN SHALLOW WATER.
Master's thesis,
Julian Edward Minard. Sep 73, 71p

Descriptors: *Ocean waves, *Internal waves, *Shallow water, Pacific Ocean, Temperature, Turbulence, Underwater sound, Salinity, Theses.
Identifiers: North Pacific Ocean.

Measurements of temporal and spatial scale sizes of small scale temperature fluctuations were made in 19 meters of water from the NUC Oceanographic Research Tower off San Diego, California. Horizontal and vertical measurements were made using a two meter straight line array of seven thermistors. In addition to temperature, waves and orthogonal water particle velocities (turbulence) were measured simultaneously. Internal waves were found on two of five runs. (Modified author abstract)

AD-775 254/6GA PC$9.00/MF$1.45
Florida State Univ Tallahassee Mesoscale Air-Sea Interaction Group
THE INFLUENCE OF COASTLINE GEOMETRY AND BOTTOM TOPOGRAPHY ON THE EASTERN OCEAN CIRCULATION.
Technical rept.,
Harley E. Hurlburt. Jan 74, 116p Rept no. 117
Contract N00014-67-A-0235-0002, Grant NSF-GA-29734

Descriptors: *Upwelling, *Ocean currents, *Ocean bottom topography, Mathematical models, Coastal regions, Pacific Ocean, Wind.

An important feature of the eastern ocean circulation is coastal upwelling. Associated with the upwelling is an equatorward surface jet and a poleward undercurrent. The present investigation focuses attention on the effects longshore variations in bottom topography and coastline geometry have on these phenomena.

AD-775 298/3GA PC$3.25/MF$1.45
Naval Research Lab Washington D C
REFLECTION OF INTERNAL GRAVITY WAVES BY A LAYERED DENSITY ANOMALY.
Final rept.,
Richard P. Mied, and John P. Dugan. 21 Dec 73, 32p Rept no. NRL-7649

Descriptors: *Gravity waves, *Reflection, *Stratification, Internal waves, Oceans, Numerical analysis, Density.
Identifiers: Internal gravity waves.

The characteristics of the propagation of internal gravity waves in the ocean, either upward from the bottom or downward from the region of the surface, is of interest to oceanographers because of the implications to the total energy budget of the internal wave field. This report considers the interaction of a plane internal wave train with a diffuse layer embedded in a density profile possessing an otherwise exponential dependence of height.

AD-775 333/8GA PC$7.50/MF$1.45
Rosenstiel School of Marine and Atmospheric Science Miami Fla
CHURCH GABBRO TECHNICAL NOTE: CONTINUOUS CURRENT PROFILES,
Scott C. Daubin. Jan 74, 342p Rept no. UM-RSMAS-74002
Contract N00014-67-A-0201-0024
Report on Long Range Acoustic Propagation Project.

Descriptors: *Caribbean Sea, *Ocean currents, Deep water, Statistical data, Power spectra.

Deep ocean current profiles are reported from a position in the Cayman Trough of the Caribbean, covering the depths between 850 and 4833 meters and at hourly intervals during the time period 30 November 1972 through 11 Dec 1972. The profiles were derived from measurements made by 53 inclinometers which were integral with a moored, compliant acoustic array. The profiles are displayed as an isometric set and individually. Time series current data from each instrument location along the line and their power spectra are presented. Profiles of estimated geostrophic current components are also shown. There is evidence of a more or less steady northwesterly current of between 3 and 8 cm/sec at mid-depths, and an intermittent westerly bottom current of 7 cm/sec. (Modified author abstract)

AD-775 561/4GA Reprint
Coastal Engineering Research Center Fort Belvoir Va
A STUDY OF OCEANIC MIXING WITH DYES AND MULTISPECTRAL PHOTOGRAMMETRY,
P. G. Teleki, J. W. White, and D. A. Prins. 1973, 19p Rept no. CERC-Reprint-2-74
Availability: Pub. in Proceedings of the ASP Symposium on Remote Sensing in Oceanography, Lake Buena Vista, Florida, Oct 73, p772-787 1973.

Descriptors: *Ocean currents, *Coastal regions, Turbulent diffusion, Tracer studies, Dyes, Multiband spectral reconnaissance.
Identifiers: *Remote sensing.

The possibility of studying coastal currents and turbulent mixing by remote sensing is investigated. In mixed regions it is essential to identify the sources of constituent water masses, their rate of propagation and discharge. The spectral responses of water-tracing dyes to various film-filter combinations were investigated under field and laboratory conditions. Preliminary results indicate that conservative tracers which are spectrally stable can be recorded isolated from others in b and w multispectral imagery, and can also be reconstructed in color composites, providing a label for water masses of varying origin. (Author)

AD-775 564/8GA Reprint
Florida State Univ Tallahassee Dept of Oceanography
SEA LEVEL SLOPE ALONG CONTINENTAL BOUNDARIES,
Wilton Sturges. 17 Oct 73, 9p Rept no. 118
Contract N00014-67-A-0235-0002
Prepared in cooperation with Rhode Island Univ., Kingston Contract N00014-68-A-0215-0003. Revision of report dated 13 Jun 73.
Availability: Pub. in Jnl. of Geophysical Research, v79 n6 p825-830, 20 Feb 74.

Descriptors: *Coastal regions, *Sea level, Atlantic Ocean, Pacific Ocean, Latitude.

The variation of sea level along continental boundaries is studied from a variety of data. Along the western boundaries of the Atlantic and Pacific oceans, sea level falls approximately 80 cm between the equator and 40 degrees N or S. Along the eastern boundaries the change in level is about one-third this amount. This meridional slope is shown to be the correct amount required by the change with latitude of surface slope across the boundary currents. (Modified author abstract)

E74-10319 PC$4.75/MF$1.45
National Oceanic and Atmospheric Administration, Miami, Fla. Atlantic Oceanographic and Meteorological Labs.
REMOTE SENSING OF OCEAN CURRENTS.
Bimonthly rept. 4 Nov 73-4 Jan 74,
George A. Maul. 4 Jan 74, 32p NASA-CR-136808
Contract NASA Order S-70246-AG
Original contains imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S.D. 57198.

Descriptors: Ocean currents, Upwelling water, Water circulation, Gulf of Mexico, Earth resources program, Water color, Sea states, Light scattering.

The author has identified the following significant results. A time series of the Loop Current in the Gulf of Mexico, covering an annual cycle of growth, spreading, and decay, has been obtained in synchronization with ERTS-1. Computer enhanced images, which are necessary to extract useful oceanic information, show that the current can be observed either by color or sea state effects associated with the cyclonic boundary. The color effect relates to the spectral variations in the optical properties of the water and its suspended particles, and is studied by radiative transfer theory. Significant oceanic parameters identified are: the probability of forward scattering, and the ratio of scattering to total attenuation. Several spectra of upwelling diffuse light are computed as a function of the concentration of particles and yellow substance. These calculations compare favorably with experimental measurements and show that the ratio of channels method gives ambiguous interpretative results. These results are used to discuss features in images where surface measurements were obtained and are extended to tentative explanation in others.

N74-15068/1GA PC$4.50/MF$1.45
New York Univ., N.Y. School of Engineering and Science.
THE ELEVATION, SLOPE, AND CURVATURE SPECTRA OF A WIND ROUGHENED SEA SURFACE.
Final Report.
W. J. Pierson, Jr., and R. A. Stacy. Dec 73, 129p NASA-CR-2247
Contract NAS1-10090

Descriptors: *Ocean surface, *Sea roughness, *Surface waves, *Wind effects, Capillary waves, Friction measurement, Gravity waves, Isotropic turbulence, Rayleigh scattering, Spectrum analysis, Viscous flow.

For abstract, see STAR 1206

PB-228 852/0GA PC$9.25/MF$1.45
Nielsen Engineering and Research, Inc., Mountain View, Calif.
APPLICATION OF BOUNDARY-LAYER THEORY TO DISPERSION IN NON-STRATIFIED TWO-DIMENSIONAL ESTUARIES.
Technical rept.,
Jack N. Nielsen, and Gary D. Kuhn. 1973, 122p NEAR-TR-45 W74-04983, OWRR-C-3189(3698)(1)
Contract DI-14-31-0001-3698

Descriptors: *Estuaries, *Tidal currents, Mathematical models, Turbulent boundary layer, Stratification, Mixing, Dispersing, Water pollution.
Identifiers: Path of pollutants.

An analytical formula representing the law of the wall and the law of the wake of turbulent boundary-layer theory has been found to represent the vertical velocity profiles of both laboratory channels and field data from real estuaries. The formula is used in an itegral boundary-layer calculation method to calculate the detailed time-dependent flow field of two-dimensional estuaries. For given tidal information, only the integrated continuity and momentum equations are necessary to calculate the two parameters of the formula. An analytical expression for the concentration profile is derived based on an analogy between turbulent exchange of momentum and mass. Good comparisons between theory and experiment were obtained for the flow field of a laboratory flume.

PB-228 882/7GA PC$4.00/MF$1.45
Woods Hole Oceanographic Institution, Mass.
THE DESIGN, LOGISTICS AND INSTALLATION OF A SOFAR FLOAT TRACKING STATION AT GRAND TURK ISLAND, B.W.I.
Technical rept.,
Robert G. Walden, Henri O. Berteaux, and Foster Striffler. Oct 73, 77p WHOI-73-73
Grant NSF-GX-32571

Descriptors: *Water masses, *Atlantic Ocean, *Tracking stations, *West Indies, *Sofar, Buoys, Acoustic detection, Computer programs, Underwater equipment, Grand Turk Island.

The Mid-Ocean Dynamics Experiment (MODE) under the Office of the International Decade of

Oceanography, National Science Foundation, included plans for the deployment of long-range SOFAR floats in a two degree square area approximately 400 miles Southwest of Bermuda. Listening stations at Bermuda, Eleuthera and Puerto Rico were to be used to track the motion of these floats. An additional station at Grand Turk Island, British West Indies, was requested to provide an expanded and more reliable tracking capability. In addition a spare installation was to be provided which could be installed within relatively short notice at Eleuthera or Puerto Rico if required. The design, logistical considerations and installation of the Grand Turk Island station are documented in this report. (Author)

8E. Geodesy

AD-774 867/6GA PC$3.00/MF$1.45
Naval Postgraduate School Monterey Calif
CORRECTIONS FOR UNDERWATER GRAVIMETRY.
Interim rept.,
Robert S. Andrews. Jan 74, 16p Rept no. NPS-58AD74011A

Descriptors: *Gravity, *Surveys, *Gravimetry, Underwater, Ocean bottom topography, Shallow water.

Because underwater gravity surveys are usually conducted in coastal waters, several unique corrections are required to reduce the observed data for calculation of free-air and Bouguer anomalies. The most logical sequence for the application of corrections would be: terrain correction (if necessary) to reduce bathymetric irregularities to a flat, horizontal bottom; removal of the upward attraction of the water above the meter; free-air correction to bring the meter measurement to the surface of the reference spheroid; filling in the ocean below the spheroid with rock for a Bouguer anomaly calculation or with water for a free-air anomaly calculation. The terrain correction must be handled carefully as the bathymetric irregularities are immersed in water of finite density and, due to the close proximity of land, topographic irregularities immersed in air may be within the range of the correction graticule grid. (Modified author abstract)

AD-775 393/2GA PC$3.00/MF$1.45
Massachusetts Inst of Tech Cambridge Dept of Earth and Planetary Sciences
ANALYSIS OF LASER DATA FOR GEODETIC PURPOSES.
Final rept. 2 Apr-30 Sep 73,
Irwin I. Shapiro, and Robert W. King. 25 Oct 73, 6p AFCRL-TR-73-0689
Contract F19628-73-C-0248

Descriptors: *Earth(Planet), Rotation, Polar regions, Motion, Satellite tracking systems, Moon, Lasers, Range finding.
Identifiers: Laser range finders, Planetary ephemeris program, Polar motion.

MIT's Planetary Ephemeris Program has been modified to permit a weighted least squares estimate for variations in the earth's rotation and polar motion using earth satellite and lunar laser ranging data. A test solution was performed with data obtained during the first two years of the lunar laser ranging experiment. (Author)

N74-15063/2GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
GRAVITY MODEL IMPROVEMENT INVESTIGATION.
J. W. Siry, W. D. Kahn, J. W. Bryan, and F. F. Vonbun. Jan 73, 15p NASA-TM-X-70550, X-590-73-249

Descriptors: *Geoids, *Gravitational fields, *Oceans, Altimeters, Geos-c satellite, Satellite tracking.

For abstract, see STAR 1206

8F. Geography

E74-10274 PC$4.00/MF$1.45
Texas A and M Univ., College Station. Remote Sensing Center.
MONITORING THE VERNAL ADVANCEMENT AND RETROGRADATION (GREEN WAVE EFFECT) OF NATURAL VEGETATION.
Progress rept. no. 6, 28 Nov 73-27 Jan 74,
J. W. Rouse, Jr. 27 Jan 74, 10p NASA-CR-136660
Contract NAS5-21857

Descriptors: Vegetation, Annual variations, Great plains corridor(North America), Rangelands, Earth resources program, Agriculture, Resources management, Multispectral band scanners, Land use.

The author has identified the following significant results. Primary emphasis during the period has been given to completing the resource and land use mask overlays for ultimate subsite MSS data extraction and analysis, refining the computer mask program, verifying resultant masks, and evaluating the initial subsite data. Standard deviations for the selected subsites were generally reduced significantly when compared to the values for the overall 7km x 7km test site areas. This indicates that the masking technique has been successful in reducing the variability of the ERTS-1 MSS data for ultimate subsite comparisons with ground data. The techniques used to locate the 7km x 7km test site areas and extract masked subsite data apparently limit the ability to reliability locate identical very small subsite areas for temporal comparisons. Current evidence indicates that areas which include less than about four pixel elements in either dimension are probably unreliable.

E74-10292 PC$4.00/MF$1.45
Alaska Univ., College. Geophysical Inst.
FEASIBILITY STUDY FOR LOCATING ARCHAEOLOGICAL VILLAGE SITES BY SATELLITE REMOTE SENSING TECHNIQUES.
Progress rept. Jan-Jul 73,
John P. Cook, and W. J. Stringer. 30 Jan 74, 16p NASA-CR-136679
Contract NAS5-21833

Descriptors: Archaeology, Spectral signatures, Multispectral photography, Alaska, Communities, Earth resources program, Photointerpretation, Signature analysis, Populations, Position(Location).

The author has identified the following significant results. The objective is to determine the feasibility of detecting large Alaskan archaeological sites by satellite remote sensing techniques and mapping such sites. The approach used is to develop digital multispectral signatures of dominant surface features including vegetation, exposed soils and rock, hydrological patterns and known archaeological sites. ERTS-1 scenes are then printed out digitally in a map-like array with a letter reflecting the most appropriate classification representing each pixel. Preliminary signatures were developed and tested. It was determined that there was a need to tighten up the archaeological site signature by developing accurate signatures for all naturally-occurring vegetation and surface conditions in the vicinity of the test area. These second generation signatures have been tested by means of computer printouts and classified tape displays on the University of Alaska CDU-200 and by comparison with aerial photography. It has been concluded that the archaeological signatures now in use are as good as can be developed. Plans are to print out signatures for the entire test area and locate on topographic maps the likely locations of archaeological sites within the test area.

8G. Geology and Mineralogy

AD-774 801/5GA PC$4.00/MF$1.45
Army Engineer Waterways Experiment Station Vicksburg Miss
MATERIAL PROPERTIES FOR POSTSHOT MIXED COMPANY ANALYSIS: RECOMMENDATIONS BASED ON RECENT LABORATORY AND IN SITU TEST DATA.
Final rept.,
John Q. Ehrgott, and John G. Jackson, Jr. Jan 74, 80p Rept no. AEWES-Misc-Paper-S-74-1
Presented at the Defense Nuclear Agency Strategic Structures Long-Range Planning Meeting Held at Menlo Park, Calif., 15-17 May 73.

Descriptors: *Rock mechanics, *Soil mechanics, *Nuclear explosions, Ground motion, Stresses, Test methods, Nuclear industrial applications, Airburst, High explosives, Cratering, Seismic detection, Simulation, Sites, Ground shock, Surveys, Predictions, Precursors.
Identifiers: Mixed company shot 3.

The paper presents the results of a reevaluation of the Mixed Company site profile and constitutive properties using both field and laboratory data. Revisions to the subsurface profile were based primarily on the water contents determined in the soil overburden at shot time. An extensive reanalysis of the seismic velocity data was conducted. New constitutive property recommendations for the overburden soil were developed based on laboratory tests conducted on specimens taken in the field just a few days after the event. The properties of the Kayenta Formation were revised to consider the effect of loading rate on the initial portion of the uniaxial strain (UX) test stress-strain curves, the effects of anisotropy on the observed triaxial shear (TX) and UX test behaviors, and the correlation observed between shear strength obtained from laboratory tests and strength obtained from an in situ test.

AD-774 810/6GA PC$3.00/MF$1.45
Wright State Univ Dayton Ohio
GRAVITY ANOMALIES AS INDICATORS OF GROUNDWATER RESERVES IN GLACIAL DEPOSITS.
Final rept.,
Benjamin H. Richard, Alan King, and Charles Contrino. Aug 73, 20p ETL-CR-73-16
Contract DAAK02-71-C-0256

Descriptors: *Geophysical prospecting, *Gravel, *Ground water, Ohio, Deposits, Gravity, Anomalies.
Identifiers: *Gravity anomalies.

The study was conducted in terrain covered with glacial debris to determine the value of gravity measurements in the search for gravel deposits. The area used was a part of Ohio where there was considerable data available on the character of the glacial cover and the bedrock surface beneath. A residual gravity map was calculated for the area using 750 field stations. This map was compared to existing bedrock maps. The gravity low was over the Teays River Valley. Seismic refraction verified these conclusions and defined the shape of this preglacial valley. Two-dimensional gravity model studies were then conducted to determine if the lows within the major low were caused by high concentrations of gravel. The model studies suggest strongly that gravel is related to the greatest lows. (Modified author abstract)

AD-774 894/0GA PC$4.00/MF$1.45
Bureau of Mines Twin Cities Minn Twin Cities Mining Research Center
FRAGMENTATION ANALYSIS - FUNDAMENTAL PROCESSES.
Final technical rept. Jan 72-Dec 73,
L. S. Sundne, D. I. Kurth, and C. W. Schultz. 31 Dec 73, 98p Rept no. P10-4
ARPA Order-1579

Descriptors: *Rock mechanics, *Fragmentation, Test methods, Particle size, Mechanical energy.

To investigate the effect of energy on rock fragmentation, initial testing was carried out using a drop test device. A total of 180 specimens of Wausau quartzite and anorthosite of 3.0 to 3.5 inch size were fragmented in this device. An analysis of the fragment distribution results of the drop tests showed that the energy applied was approximately inversely proportional to the mean fragment size. However, these results were not totally conclusive because of the limited energy available and the narrow band of drop heights available. A total of 270 irregular 3.0 to 3.5 inch specimens and 150 disc-shaped specimens of Wausau quartzite, anorthosite, and Felch marble were then fragmented with the impact pendulum device. Computer programs were written to analyze sieve data and to provide energy calculations. Results indicated that a power law could be obtained that provided the inverse relation between specific crushing energy and mean fragment size. (Modified author abstract)

AD-775 195/1GA Reprint
Cornell Univ Ithaca N Y Coll of Engineering
FRICTIONAL HEATING OF THE DESCENDING LITHOSPHERE,
D. L. Turcotte, and G. Schubert. 16 May 73, 14p
AFOSR-TR-74-0195
Contract F44620-69-C-0063
Sponsored in part by Grant NSF-GA-10963. Prepared in cooperation with California Univ., Los Angeles. Dept. of Planetary and Space Science. Revision of report dated 12 Dec 72.
Availability: Pub. in Jnl. of Geophysical Research, v78 n26 p5876-5886 Sep 73.

Descriptors: *Earth crust, *Structural geology, Submarine troughs, Volcanoes, Friction, Heating, Melting.
Identifiers: *Plate tectonics, Benioff zone.

Linear chains of active volcanoes are usually associated with oceanic trenches. It is postulated that the active volcanoes lie above the point on the slip zone between the descending lithosphere and the overlying mantle where partial melting of the descending oceanic crust takes place. By assuming that the frictional stress on the slip zone is either constant or proportional to depth, the thermal structure of the descending lithosphere is determined. The alternative theories are used to determine the shear stresses and friction coefficients for various trench-volcano systems. Values for the shear stress and friction coefficient have standard deviations of 10 and 24%, respectively. The authors conclude that the shear stress on a slip zone is probably weakly dependent on depth with a value near 1.35 kb. The results are compared with previous calculations. (Author)

AD-775 229/8GA PC$6.00/MF$1.45
Illinois Univ Urbana Dept of Civil Engineering
INFLUENCE OF PORE WATER PRESSURE ON THE ENGINEERING PROPERTIES OF ROCK.
Technical rept. no. 6 (Final), Jun 72-Sep 73,
Kakuichiro Adachi, and Gholamreza Mesri. Sep 73, 243p
Contract H0220069, ARPA Order-1579

Descriptors: *Rock mechanics, *Pore pressure, *Compressive properties, Test methods, Failure, Granite, Limestone, Sandstone.
Identifiers: Marble.

The objective of this investigation was to determine the influence of pore water pressure on the engineering properties of rock. A series of drained triaxial compression tests were performed on Vermont marble in order to study strain rate effects. Isotropic compression and triaxial compression tests under drained and undrained conditions were performed on Berea sandstone, Salem limestone, Vermont marble, and Barre granite. The drained and undrained tests resulted in a single Mohr-Coulomb failure envelope in terms of effective stress for each rock type. In all cases the failure envelope was concave to the normal stress axis. The modified Mohr-Coulomb failure envelope plotted as a straight line for each rock type.

AD-775 230/6GA PC$3.25/MF$1.45
Massachusetts Inst of Tech Cambridge
STATIC MECHANICAL PROPERTIES OF MIXED COMPANY SANDSTONE.
Final rept. Sep 72-Sep 73,
W. F. Brace. 4 Dec 73, 38p DNA-3229F
Contract DNA001-73-C-0043

Descriptors: *Rock mechanics, *Sandstone, Test methods, Compressive properties, Electrical resistivity.

A number of physical properties of Entrada sandstone were investigated over a range of pressure to 10 kb, room temperature. The sandstone is a massive, very uniform, arkosic sandstone with a grain size close to 0.1 mm and a calcite cement. Porosity of our material ranged from 14% to 24%. The pressure-volumetric strain relation was highly nonlinear and nonrecoverable. The compressional velocity of the sandstone ranged from 2 to 4 km/sec. Relative attention is nearly 50% and is independent of pressure. Electrical resistivity of sandstone is anomalously low when saturated with normal tap water. (Modified author abstract)

AD-775 231/4GA PC$4.00/MF$1.45
Utah Univ Salt Lake City Dept of Mechanical Engineering
CREEP FRACTURE OF ROCK.
Final rept. 28 Dec 71-8 Jul 73,
Wolfgang R. Wawersik, and Wayne S. Brown. Jul 73, 84p Rept no. UTEC-ME-73-197
Contract H0220007, ARPA Order-1579

Descriptors: *Rock mechanics, *Fracture(Mechanics), *Creep, Test methods, Granite, Sandstone, Shear stresses, Porosity, Metamorphic rock.

Experiments were conducted to assess the time-dependent behavior of brittle rock and of rough, unfilled tension joints as a function of stress state and water content at ambient temperature. Quasi-static tests were performed on Westerly granite, Nugget sandstone and Tennessee marble at confining pressures up to 10,000 psi. Creep was measured on granite and sandstone at 1,000 psi, 5,000 psi and 10,000 psi confining pressure. Finally, creep tests were carried out on granite in uniaxial tension. Both axial and lateral strains were measured in all experiments. (Modified author abstract)

AD-775 349/4GA Reprint
Woods Hole Oceanographic Institution Mass
GEOPHYSICAL STUDY OF ANTILLES OUTER RIDGE, PUERTO RICO TRENCH, AND NORTHEAST MARGIN OF CARIBBEAN SEA,
E. T. Bunce, J. D. Phillips, and R. L. Chase. 18 Jun 73, 18p Rept nos. WHOI-74-7, WHOI-Contrib-2897
Contract N00014-66-C-0241, Grant NSF-GA-27516
Prepared in cooperation with British Columbia Univ., Vancouver.
Availability: Pub. in The American Association of Petroleum Geologists Bulletin, v58 n1 p106-123 Jan 74.

Descriptors: *Caribbean Sea, *Ocean ridges, *Structural geology, Magnetic anomalies, Seismic reflection.
Identifiers: *Plate technics.

New seismic and magnetic information from the Antilles Outer Ridge and Trench region has been combined with previous geophysical observations to provide an explantation for the origin of the crust there, in the framework of plate tectonics. This suggests that the ridge was formed at the junction of two ancient oceanic plates which accreted as Africa separated from North America and South America, respectively. (Modified author abstract)

ARH-2610 PC$5.50/MF$1.45
Atlantic Richfield Hanford CO., Richland, Wash. (Usa).
GEOCHEMICAL VARIATION OF COLUMBIA RIVER BASALTS BENEATH THE HANFORD RESERVATION, WASHINGTON.
J. B. Tatman. 30 Sep 72, 66p
Contract AT(45-1)-2130

Descriptors: (*Hapo, *Geology), (*Basalt, *Geochemistry), Chemical composition, Geologic deposits.

For abstract, see NSA 29 05, number 10157.

E74-10283 PC$3.50/MF$1.45
Rockwell International Corp., Thousand Oaks, Calif. Science Center.
TECTONIC ANALYSIS OF BAJA CALIFORNIA AND PARRAS SHEAR BELT IN MEXICO.
Progress rept. Jun-Nov 73,
Linda Monem Abdel-Gawad, and Linda Tubbesing. Jan 74, 30p SC543.9PR NASA-CR-136669
Contract NAS5-21767

Descriptors: Tectonics, Structural properties(Geology), Geological faults, Mexico, Earth resources program, Volcanology, Seismology, Photomapping, Photogeology.

The author has identified the following significant results. Geological correlation of terrain across the Gulf of California using ERTS-1 imagery revealed significant similarities between Isla Tiburon, Isla Angel de la Guarda, and the San Carlos Range in mainland Mexico. ERTS-1 imagery was used to check the validity of the existence of major trans-Baja fault zones. ERTS-1 imagery also shows that high albedo sediments similar to known late Tertiary marine sediments are widespread in southern and middle Baja and extend in places to the eastern side of the Peninsula. Major faults in northern Mexico and across the border in the United States were mapped, and ample evidence was found that the Parras and parts of the Texas lineament are belts of major transverse shear faults in areas outside the supposed limit of the Texas and Parras lineaments. A fundamental concept which may help explain many complexities in the tectonic development is beginning to emerge: The southwestern part of North America was torn by massive left-lateral shear of transverse trend (east-west) during the compressive stage of the late Mesozoic and early Cenozoic. This tectonic style has changed into tensional rifting (Basin and Range) and right-lateral shear later in the Cenozoic and Quaternary.

E74-10314 PC$4.00/MF$1.45
New Mexico State Bureau of Mines and Mineral Resources, Socorro.
GEOLOGIC ANALYSIS AND EVALUATION OF ERTS-A IMAGERY FOR THE STATE OF NEW MEXICO.
Progress rept. 29 Nov 73-29 Jan 74,
Frank E. Kottlowski. 29 Jan 74, 5p NASA-CR-136799
Contract NAS5-21861

Descriptors: New Mexico, Structural properties(Geology), Lithology, Geomorphology, Earth resources program, Mineral deposits, Geological faults, Tectonics.

The author has identified the following significant results. Many circular to elliptical features have been identified on the ERTS-1 images, only some of which can be accounted for by existing data. A small number of circular features are adjacent to existing ore deposits, but such relationships should not be emphasized unless other supporting data exists. Circular features may be tectonically

or geomorphically controlled, or a combination of the two. A limited number are man-made. A preliminary listing of features which may have circular expression are listed. Photographic examples of identified and unidentified circular features will be included in the final report along with a thorough discussion and analysis. Comparisons will be made with existing gravity and magnetic data.

HW-51030(Rev.1) PC$3.25/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
BIBLIOGRAPHY OF THE GEOLOGY OF SOUTH CENTRAL WASHINGTON AND PERTINENT ADJACENT AREAS.
R. E. Brown. 1 Jul 59, 24p

Descriptors: (*Hapo, *Geology), Bibliographies, Hydrology, Liquid wastes, Oregon, Radioactive waste disposal, Washington, Waste storage.

For abstract, see NSA 29 05, number 10161.

HW-62530 PC$3.00/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
SURFACE OF THE RINGOLD FORMATION BENEATH THE HANFORD WORKS AREA.
R. E. Brown. 17 Mar 60, 13p

Descriptors: (*Hapo, *Geology), Columbia river, Flow rate, Ground water, Hydrology, Radioactive waste disposal, Radionuclide migration, Waste storage.

For abstract, see NSA 29 05, number 10162.

N74-15065/7GA PC$3.50/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ON THE BREAKUP OF TECTONIC PLATES BY POLAR WANDERING.
H. Liu. Aug 73, 28p NASA-TM-X-70549, X-592-73-207
Subm-Submitted for Publication.

Descriptors: *Dynamic models, *Polar regions, *Tectonics, Fracturing, Lithosphere, Plastic properties, Stress functions.

For abstract, see STAR 1206

N74-15070/7GA PC$3.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
OIL EXPLORATION SUBPROGRAM GEOLOGICAL INTERPRETATION OF IMAGES PROVIDED BY THE ERTS-A SATELLITE.
C. Vargas F.. Jan 74, 10p NASA-TT-F-15265
Contract NASW-2483
Tran-Transl. Into English of "Sub Program a Exploracion Petrolera, Interpretacion Geologica de Imagenes Proporcio Nadas Por El Satelite ERTS-a", Servicio Geol. De Bolivia, Programa Del Satelite Technol. De Resursos Nat., la Paz, Report, 1973 9 p.

Descriptors: *Bolivia, *Oil exploration, *Photogeology, *Photointerpretation, Earth resources program, Earth resources technology satellite 1, Geological surveys.

For abstract, see STAR 1206

N74-15072/3GA PC$3.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
TECTONIC PHYSICS SUBPROGRAM STRUCTURAL GEOLOGY OF BOLIVIA'S NORTHERN HIGH PLATEAU (SOUTHERN PERU AND NORTHERN CHILE).
C. Martinez. Jan 74, 11p NASA-TT-F-15263
Contract NASW-2483
Tran-Transl. Into English of "Sub-Programa Tectonofisica Geologia Estructural Del Altiplano Norte de Bolivia (Sur Del Peru Y Norte de Chile)" la Paz, Servico Geologico di Bolivia, 1973 4 p.

Descriptors: *Bolivia, *Chile, *Peru, *Tectonics, Earth resources technology satellites, Photointerpretation, Plateaus.

For abstract, see STAR 1206

UCID-16377 PC$3.25/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
HIGH-PRESSURE MECHANICAL PROPERTIES OF AN AREA 12, NEVADA TEST SITE TUFF.
A. Duba, A. E. Abey, and H. C. Heard. 19 Nov 73, 21p
Contract W-7405-Eng-48

Descriptors: (*Nevada test site, Tuff), (*Tuff, *Mechanical properties), Boreholes, Drill cores, Geology, Pressure dependence, Sampling, Soils.

For abstract, see NSA 29 05, number 10167.

USGS-474-175 PC$5.45/MF$1.45
Geological Survey, Denver, Colo. (Usa).
TECHNIQUES FOR THE QUANTITATIVE DETERMINATION OF ALLUVIAL PHYSICAL PROPERTIES FROM GEOPHYSICAL LOGS, SOUTHERN YUCCA FLAT, NEVADA TEST SITE.
R. D. Carroll, and D. C. Muller. Nov 73, 113p
Contract AT(29-2)-474

Descriptors: (*Nevada test site, *Geology), Boreholes, Depth, Drill cores, Ground water, Hydrology, Physical properties, Quantity ratio, Soils.

For abstract, see NSA 29 05, number 10163.

8H. Hydrology and Limnology

AD-775 248/8GA PC$3.00/MF$1.45
IBM Thomas J Watson Research Center Yorktown Heights N Y
CHANNEL NETWORK SIMULATIONS.
Final rept.,
J. S. Smart. Feb 74, 13p
Contract N00014-70-C-0188
See also AD-722 008.

Descriptors: *Geomorphology, Channel flow, Drainage, Networks, Mathematical models.
Identifiers: Random walk.

The report gives a brief summary of the principal results and achievements of the research carried out under the contract among which are: Random-walk model of drainage development; topics in theoretical geomorphology; and, the random model of drainage basin composition.

ARH-1945 PC$3.00/MF$1.45
Atlantic Richfield Hanford CO., Richland, Wash. (Usa).
B PLANT ION EXCHANGE FEED LINE LEAK.
K. H. Tanaka. 25 Jan 71, 13p

Descriptors: (*Hapo, *Waste management), (*Cesium 137, *Radiation monitoring), (*Radioactive wastes, *Leaks), (*Soils, Radiation monitoring), Aqueous solutions, Boreholes, Contamination, Drill cores, Ion exchange, Isotope separation, Leak testing, Liquid wastes, Pipelines, Radioactive waste processing, Radioactivity, Radionuclide migration, Sampling, Separation processes.

For abstract, see NSA 29 05, number 10134.

ARH-1972 PC$3.50/MF$1.45
Atlantic Richfield Hanford CO., Richland, Wash. (Usa).
RADIOACTIVE EFFLUENT REDUCTION FROM 200 AREA FACILITIES.
G. L. Hanson. 29 Jan 71, 28p

Descriptors: (*Hapo, *Waste management), (*Fuel reprocessing plants, Waste management), (*Radioactive wastes, Waste management), (*Nonradioactive wastes, Waste management), Cesium 137, Condensates, Coolants, Decontamination, Fission products, Gaseous wastes, Iodine 131, Liquid wastes, Nitrogen oxides, Plutonium 239, Radiation monitoring, Radioactive waste disposal, Radioactive waste processing, Radioactivity, Soils, Stack disposal, Strontium 90, Uranium trioxide, Vapor condensation, Water.

For abstract, see NSA 29 05, number 10120.

ARH-2015(Pt.4) PC$3.00/MF$1.45
Atlantic Richfield Hanford CO., Richland, Wash. (Usa).
RADIOACTIVE CONTAMINATION IN UNPLANNED RELEASES TO GROUND WITHIN THE CHEMICAL SEPARATIONS AREA CONTROL ZONE THROUGH 1970.
H. L. Maxfield. 30 Mar 71, 13p

Descriptors: (*Hapo, *Radioactive wastes), (*Soils, *Contamination), Accidents, Fission products, Leaks, Liquid wastes, Radioactive waste disposal, Radioactive waste processing, Radioactivity, Radiochemistry, Reprocessing, Solid wastes, Uranium, Waste storage.

For abstract, see NSA 29 05, number 10135.

ARH-2757(Pt.4) PC$3.00/MF$1.45
Atlantic Richfield Hanford CO., Richland, Wash. (Usa).
RADIOACTIVE CONTAMINATION IN UNPLANNED RELEASES TO GROUND WITHIN THE CHEMICAL SEPARATIONS AREA CONTROL ZONE THROUGH 1972 (EXCLUSIVE OF LIQUID WASTE STORAGE TANK FARMS).
H. L. Maxfield. 3 Apr 73, 11p

Descriptors: (*Hapo, *Radioactive wastes), (*Soils, *Radioactivity), Accidents, Contamination, Leaks, Liquid wastes, Radiation monitoring.

For abstract, see NSA 29 05, number 10136.

BNWL-CC-1197-6 PC$6.25/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
ENVIRONMENTAL STATUS OF THE HANFORD RESERVATION FOR NOVEMBER--DECEMBER 1967. (ANNUAL SUMMARY).
C. B. Wooldridge. Apr 68, 84p

Descriptors: (*Hapo, *Radiation monitoring), (*Environment, Radiation monitoring), (*Beta sources, Radiation monitoring), (*Iodine 131, Radiation monitoring), Birds, Columbia river, Drinking water, Earth atmosphere, Fallout, Radioactive waste disposal, Radioactivity, Sampling, Stack disposal, Surface air, Surface waters, Water.

For abstract, see NSA 29 05, number 10123.

BNWL-CC-637-12 PC$5.75/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
ENVIRONMENTAL STATUS OF THE HANFORD RESERVATION FOR DECEMBER 1966. (ANNUAL SUMMARY).
T. H. Essig, and R. B. Hall. 20 Mar 67, 73p

Descriptors: (*Hapo, *Radiation monitoring), (*Environment, Radiation monitoring), (*Fallout, Radiation monitoring), (*Manganese 56, Radiation monitoring), Columbia river, Drinking water, Earth atmosphere, Gaseous wastes, Iodine 131, Liquid wastes, Personnel, Radiation doses, Radioactive waste disposal, Radioactivity, Sam-

pling, Soils, Stack disposal, Surface waters, Water.

For abstract, see NSA 29 05, number 10121.

BNWL-CC-913 PC$4.50/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
ENVIRONMENTAL STATUS OF THE HANFORD PROJECT. 1965 ANNUAL SUMMARY.
T. H. Essig, and R. B. Hall. 8 Nov 66, 47p
Contract AT(45-1)-1830

Descriptors: (*Hapo, *Environment), (*Phosphorus 32, *Radiation monitoring), (*Cesium 137, Radiation monitoring), (*Zinc 65, Radiation monitoring), Aerial monitoring, Alpha sources, Beta sources, Birds, Columbia river, Drinking water, Earth atmosphere, Gamma sources, Ground water, Iodine 131, Personnel, Radioactivity, Sampling, Surface waters, Tissues, Water.

For abstract, see NSA 29 05, number 10122.

BNWL-SA-4658 PC$3.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
NOVEL PARTICLE-SIZING TECHNIQUE FOR HEALTH PHYSICS APPLICATION.
D. A. Waite, and W. L. Nees. 1972, 9p CONF-731117-2, SM-180/43

Descriptors: (*Radioactive aerosols, *Particle size), (*Aerosols, Particle size), Environment, Glow discharges, Radiation monitoring, Variations.

For abstract, see NSA 29 05, number 10124.

BNWL-1783 PC$5.45/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
RADIOECOLOGY OF IODINE-129: AN INTERIM REPORT.
J. K. Soldat, F. P. Brauer, J. F. Cline, J. E. Fager, and B. Klepper. Sep 73, 80p
Contract AT(45-1)-1830

Descriptors: (*Iodine 129, *Radioecological concentration), (*Ecosystems, *Radionuclide migration), Aquatic ecosystems, Bibliographies, Diffusion, Food chains, Gaseous wastes, Human populations, Liquid wastes, Man, Nuclear power plants, Radiation doses, Radiation hazards, Radioactive wastes, Terrestrial ecosystems, Thyroid, Uptake.

For abstract, see NSA 29 05, number 10143.

CEA-CONF-2223 PC$3.00/MF$1.45
Cea Centre de la Hague, 50 - Cherbourg (France).
FIXATION OF RUTHENIUM-106 ON VARIOUS TYPES OF SEDIMENTS.
P. Guegueniat, and J. Le Gall. 2p CONF-721146-3
In French. U.S. Sales Only.

Descriptors: (*Sediments, *Radionuclide migration), (*Ruthenium 106, *Chemical state), Carbonates, Estuaries, Iron oxides, Seawater.

For abstract, see NSA 29 05, number 10139.

CEA-CONF-2336 PC$3.00/MF$1.45
BEHAVIOR IN SUBTERRANEAN ENVIRONMENTS OF URANIUM AND THORIUM DISCHARGED BY THE NUCLEAR INDUSTRY.
D. Rancon. 17p CONF-730503-6, SM-172/55
In French. U.S. Sales Only.

Descriptors: (*Soils, *Radionuclide migration), (*Uranium, *Diffusion), (*Thorium, Diffusion), Aqueous solutions, Minerals, Ph value, Uranyl compounds.

For abstract, see NSA 29 05, number 10137.

E74-10321 PC$5.75/MF$1.45
Purdue Univ., Lafayette, Ind. Lab. for Applications of Remote Sensing.
A STUDY OF THE UTILIZATION OF ERTS-1 DATA FROM THE WABASH RIVER BASIN.
Progress rept. 1 Jul-31 Dec 73,
David A. Landgrebe. Jan 74, 52p NASA-CR-136812
Contract NAS5-21773

Descriptors: Crop identification, Water resources, Land use, Soil mapping, Atmospheric models, Wabash River Basin(IL-IN-OH), Earth resources program, Earth surface, Urban development, Imaging techniques.

The author has identified the following significant results. The most significant results were obtained in the water resources research, urban land use mapping, and soil association mapping projects. ERTS-1 data was used to classify water bodies to determine acreages and high agreement was obtained with USGS figures. Quantitative evaluation was achieved of urban land use classifications from ERTS-1 data and an overall test accuracy of 90.3% was observed. ERTS-1 data classifications of soil test sites were compared with soil association maps scaled to match the computer produced map and good agreement was observed. In some cases the ERTS-1 results proved to be more accurate than the soil association map.

HW-69369 PC$14.25/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
COMPILATION OF BASIC DATA RELATING TO THE COLUMBIA RIVER. SECTION 8. DISPERSION OF REACTOR EFFLUENT IN THE COLUMBIA RIVER.
J. K. Soldat. 16 Nov 62, 241p
Contract AT(45-1)-1350

Descriptors: (*Hapo, *Radioactive waste disposal), (*Columbia river, *Hydrodynamics), (*Alpha sources, *Radiation monitoring), (*Beta sources, Radiation monitoring), Diffusion, Environment, Fluid flow, Liquid wastes, Radioactive wastes, Radioactivity, Reactor operation, Temperature monitoring, Time dependence, Velocity.

For abstract, see NSA 29 05, number 10126.

HW-72645-RD PC$3.00/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
CHEMICAL EFFLUENTS TECHNOLOGY WASTE DISPOSAL INVESTIGATIONS, JULY–DECEMBER 1961.
D. J. Brown. Feb 62, 17p
Contract AT(45-1)-1350

Descriptors: (*Hapo, *Radiation monitoring), (*Environment, Radiation monitoring), (*Ground water, *Radioactivity), (*Alpha sources, Radiation monitoring), Beta sources, Cerium 144, Cesium 137, Cobalt 60, Contamination, Liquid wastes, Niobium 95, Praseodymium 144, Promethium 147, Radioactive waste disposal, Radionuclide migration, Ruthenium 106, Soils, Strontium 90, Tritium, Underground disposal, Waste storage, Zirconium 95.

For abstract, see NSA 29 05, number 10127.

NYO-3425-8 PC$3.75/MF$1.45
Usaec, Washington, D.C.; Fraunhofer-Gesellschaft Zur Foerderung der Angewandten Forschung E.V., Garmisch-Partenkirchen (F.R. Germany). Physikalisch-Bioklimatische Forschungsstelle.
PROGRESS REPORT FOR THE PERIOD APRIL 1, 1973 THROUGH NOVEMBER 7, 1973.
R. Reiter. 7 Nov 73, 35p
Contract AT(11-1)-3425

Descriptors: (*Fallout, *Radiation monitoring), (*Beryllium 7, Radiation monitoring), (*Phosphorus 32, Radiation monitoring), (*Sulfur 35, Radiation monitoring), Air, German federal republic, Monitoring, Ozone, Research programs.

For abstract, see NSA 29 05, number 10131.

PATENT-3 175 459 Not available NTIS
Department of the Interior, Washington, D.C.
METER FOR OPTICALLY MEASURING FLUID CURRENT VELOCITY.
Patent,
Winchell Smith, and Glen F. Bailey. Filed 1 Oct 62, patented 30 Mar 65, 7p PAT-APPL-227 615,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Stream flow, *Flowmeters, *Patents, *Velocity measurement, Stream gages, Flow measurement, Optical measuring instruments, Stroboscopes.
Identifiers: PAT-CL-88-14.

The invention relates to a meter for gauging the velocity of the flow or current in a stream or channel of a river. By means of this meter an instantaneous measure of the surface velocity of the flow or current may be obtained by direct observation of the water surface from a point above the stream or river. More particularly, the invention concerns improvements in a current velocity measuring instrument comprising a stroboscopically operated mechanism.

PATENT-3 723 133 Not available NTIS
Department of Agriculture, Washington, D.C.
METHOD OF PREPARING A DEHYDRATED DEACIDIFIED CITRUS JUICE PRODUCT.
Patent,
Robert E. Berry, and Charles J. Wagner, Jr. Filed 7 Feb 72, patented 27 Mar 73, 3p PAT-APPL-224 231,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Citrus fruits, *Food processing, Acidity.
Identifiers: PAT-CL-99-105.

This invention relates to food products prepared from citrus juices. By the method of this invention the fruit juices are deacidified and converted to a dehydrated form. In this form the new product can be mixed with other acid citrus products to produce a blend in either liquid or dehydrated powder form thereby converting the unacceptable product to one with lower acidity and commercial acceptability.

PATENT-3 754 932 Not available NTIS
Department of Agriculture, Washington, D.C.
PROTEARE AND PECTMARE ADDITIVE TO CITRUS JUICES.
Patent,
Robert A. Baker, and Joseph H. Bruemmer. Filed 16 Apr 71, patented 28 Aug 73, 4p PAT-APPL-134 834,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Citrus fruits, *Food processing, Flavor, Esthetics, Sterilization.
Identifiers: PAT-CL-99-106.

This invention relates to a method of preserving desirable appearance and flavor of certain citrus juices while processing these to eliminate unwanted factors. Specifically, it relates to a method of protecting the natural cloud of citrus juices by enzymic removal of the water-soluble pectins and insoluble pectates contributing to its loss. This treatment, when combined with cold chemical sterilization, produces a sterile juice with a stable cloud without heating.

PB-228 131/9GA PC$5.00/MF$1.45
TRACOR, Inc., Austin, Tex.
STATISTICAL ANALYSIS OF HYDROGRAPH CHARACTERISTICS FOR SMALL URBAN WATERSHEDS.
D. W. Hamm, C. W. Morgan, and H. A. Reeder. 29 Oct 73, 164p TRACOR-T73-AU-9559-U W74-04459, OWRR-C-3286(3737)(1)
Contract DI-14-31-0001-3737

Descriptors: *Surface water runoff, *Urban areas, *Statistical analysis, Nomographs, Mathematical models, Regression analysis.
Identifiers: Urban hydrology.

The purpose was to obtain equations which predict the 30-minute unit hydrograph for small urban watersheds. Equations were derived for models of the product form that correlate basin topographical features with hydrographic parameters. The models were transformed by natural logarithms so that linear regression methods could be used to obtain estimates of the exponents in the equations. The equations were applied to a wide variety of watersheds to demonstrate their validity. Confidence intervals were derived for the estimation of each hydrographic parameter. Nomograms were supplied to provide fast and accurate solutions for each equation.

PB-228 698/7GA PC$8.00/MF$1.45
Nebraska Univ., Lincoln. Dept. of Computer Science.
THE APPLICATION OF BINARY TREE STRUCTURES TO HYDROLOGIC NETWORK SIMULATORS.
Master's thesis,
Gerald McManis. May 72, 98p W74-04852, OWRR-B-016-NEB(1)

Descriptors: *Storms, *Storm sewers, *Hydrology, *Network flows, Theses, Trees(Mathematics), Analog simulation, Computer programming, Drainage, Nebraska, Urban planning, Theses.
Identifiers: *Binary trees.

Dynamic simulation techniques can provide urban water planners with needed hydrologic response information. Such techniques for modeling the interactions between a storm bounded by a generalized polygon, and any arbitrarily distributed network over which the storm passes are described and demonstrated. A simulator for the hydrologic response of any encoded channel network has been designed and implemented in FORTRAN. The network is represented by a binary tree structure within which the topologic connections, geometric and other attributes of its segments can be introduced, altered, and retrieved by a set of programmed functions. The comprehensive computer package can model either the behavior of existing drainage systems or the expected performance changes from modification of drainage systems.

PB-228 963/5GA PC$5.50/MF$1.45
Auburn Univ., Ala. Water Resources Research Inst.
PRACTICAL SIMULATION MODELS OF THE SUBSURFACE HYDROLOGIC SYSTEM WITH EXAMPLE APPLICATIONS.
Completion rept.,
F. J. Molz. Jan 74, 50p WRRI-Bull-19 W74-04973, OWRR-A-029-ALA(1)

Descriptors: *Ground water, *Hydrology, *Computerized simulation, Aquifers, Mathematical models, Computer programs, Ground water recharge, Columbia.

Several practical models of the subsurface hydrologic system are constructed. These models have as their core the two-dimensional groundwater flow equation with a vertical recharge term and subject to the assumption of horizontal flow. The recharge term is used to represent the hydrologic processes on the surface and in the unsaturated zone as far as their input to the groundwater system is concerned. In this sense, the models can be used to simulate the subsurface hydrology of a watershed--not simply the groundwater system. Various methods are discussed for evaluating the recharge term including a simple water mass balance, a climatological water balance, a more complex water balance and a recharge distribution based on the USDAHL-70 model of watershed hydrology. Application of several of the models to a watershed in Colombia, South America indicates that the models are relatively easy to apply . (Modified author abstract)

UCLA-12-937 PC$3.00/MF$1.45
California Univ., Los Angeles (Usa). Lab. Of Nuclear Medicine and Radiation Biology.
SOME ECOLOGICAL ATTRIBUTES AND PLUTONIUM CONTENTS OF PERENNIAL VEGETATION IN AREA 13.
E. M. Romney, A. Wallace, R. O. Gilbert, S. A. Bamberg, and J. D. Childress. Nov 73, 19p
Contract AT(04-1)-GEN-12

Descriptors: (*Nevada test site, *Ecology), (*Plants, *Radiation monitoring), (*Plutonium 239, Radiation monitoring), (*Plutonium 240, Radiation monitoring), Americium 241, Fallout, Grass, Shrubs, Soils.

For abstract, see NSA 29 05, number 10129.

8I. Mining Engineering

E74-10336 PC$4.00/MF$1.45
Earth Satellite Corp., Washington, D.C.
STUDY OF APPLICATION OF ERTS-A IMAGERY TO FRACTURE-RELATED MINE SAFETY HAZARDS IN THE COAL MINING INDUSTRY.
Progress rept. 1 Jan-1 Mar 74,
Charles E. Wier, Frank J. Wobber, Orville R. Russell, Roger V. Amato, and Thomas V. Leshendok. 26 Feb 74, 5p NASA-CR-136847
Contract NAS5-21795

Descriptors: Coal, Mines(Excavations), Structural properties(Geology), Fracturing, Safety, Indiana, Earth Resources program, Geological survey, Mapping, Reclamation, Slags.

The author has identified the following significant results. The mine refuse inventory maps were prepared in response to a need by both the State and the coal industry. The lack of information on the scope of the problem handicapped all people concerned in drafting realistic legislation for a severance tax on coal production to raise funds for restoration of refuse sites. The inventory was conducted rapidly and economically, and demonstrated the benefits which can be derived through remote sensing methods.

PATENT-3 329 265 Not available NTIS
Department of the Interior, Washington, D.C.
FLOTATION OF MICA.
Patent,
James S. Browning, and Ralph B. Adair. Filed 18 Aug 64, patented 4 Jul 67, 3p PAT-APPL-390 485, Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Flotation, *Mica, *Patents, Beneficiation, Nonmetalliferous minerals, Depressing reagents, Flotation reagents.
Identifiers: PAT-CL-209-166.

The invention relates to beneficiation of mica ores by flotation, and is a modification and improvement of a previous patent. The improvement is based on the fact that the process described in this invention is more positive and selective in the flotation of high quality mica concentrates, and that the process enables a selective separation of muscovite mica and biotite mica.

PATENT-3 479 638 Not available NTIS
Department of the Interior, Washington, D.C.
BEAMFORMING IN SEISMIC SURVEYING.
Patent,
Gene A. Rusnak. Filed 29 Jul 68, patented 18 Nov 69, 4p PAT-APPL-748 394, DOCKET/SUR-1348
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Seismic prospecting, Seismic reflection, Seismic refraction, Wave propagation.

The patent describes a method whereby signal strength and resolution in seismic surveying are enhanced while side reflections and energy requirements are reduced by employing a plurality of acoustic sources spaced at even half wave lengths of the desired frequency response.

PB-228 624/3GA PC$3.00/MF$1.45
Bureau of Mines, Washington, D.C.
ELECTROPHORESIS AND COAGULATION STUDIES OF SOME FLORIDA PHOSPHATE SLIMES.
Report of Investigations,
Oleg Terichow, and Alexander May. Jan 74, 13p BuMines-RI-7816
Prepared by Tuscaloosa Metallurgy Research Lab., Ala.

Descriptors: *Phosphate deposits, *Beneficiation, Slime, Coagulation, Aluminum sulfate, Electric double layer, Electrophoresis, Filtration, Precipitation.

Electrophoretic mobility measurements were made on samples of Florida phosphate slimes to determine the optimum conditions of coagulation and precipitation in aluminum sulfate solutions. The addition of silica sand and other selected materials as adagulants has demonstrated the practicability of coagulating two dissimilar particle systems by elimination of the repulsive double layers. By proper selection of the solution and its concentration, the reduction of the double layer to a zero point of charge causes coagulation and rapid precipitation of both particle systems. Confirmation was found in filtration tests and sedimentation tests. (Author)

PB-228 625/0GA PC$3.00/MF$1.45
Bureau of Mines, Washington, D.C.
THE DUSTINESS OF DIFFERENT COAL SEAMS.
Technical progress rept.,
R. J. Seibel, and F. E. McCall. Jan 74, 13p BuMines-TPR-75
Report on Bureau of Mines Dust Control Program. Prepared by Pittsburgh Mining and Safety Research Center, Bureau of Mines, Pittsburgh, Pa.

Descriptors: *Coal mining, *Coal dust, Statistical analysis, Job analysis.

A statistical comparison of the dust exposures of coal miners with identical occupations in Pittsburgh, Pocahontas, Freeport, and Kittanning seams was conducted. Results indicated that, in some cases, occupations have different dust exposures in different seams. For example, the continuous miner operator in the Pittsburgh and Pocahontas seams is exposed to more dust than the same man in the Kittanning seam but the Kittanning seam has more dust along the haulage roads than the other seams. Also, average dust exposures for similar occupations in continuous conventional mining operations are similar. (Author)

PB-228 678/9GA PC$3.00/MF$1.45
Bureau of Mines, Washington, D.C.
NUCLEAR METER FOR MONITORING THE SULFUR CONTENT OF COAL STREAMS.
Technical progress rept.
R. F. Stewart, A. W. Hall, J. W. Martin, W. L. Farrior, and A. M. Poston. Jan 74, 15p* BuMines-TPR-74

Report on Bureau of Mines Advancing Energy Utilization Program. Prepared by Bureau of Mines, Morgantown, W.Va.

Descriptors: *Sulfur, *Coal, *Gamma spectrometers, Nuclear capture, Gamma rays, Monitors, Pyrite.

A nuclear meter based on measurement of prompt capture gamma rays is being developed for monitoring the sulfur content of coal streams. Equipment has been built to measure sulfur rapidly, and methods have been devised to compensate for changes in moisture, ash, and bulk density of coal flowing through a bin. Pilot plant tests of the system with various additives to different coals show a precision and accuracy of 0.02 percent sulfur and 0.04 percent sulfur, respectively. Based on these results, a hardwired meter has been fabricated for testing in a commercial coal preparation plant. (Author)

PB-228 685/4GA PC$3.00/MF$1.45
Bureau of Mines, Washington, D.C.
PERMEABILITY CHANGES AND COMPACTION OF BROKEN OIL SHALE DURING RETORTING.
Rept. of Investigations,
Edward L. Burwell, Samuel S. Tihen, and Harold W. Sohns. Jan 74, 22p BuMines-RI-7860
Prepared by Laramie Energy Research Center, Wyo.

Descriptors: *Oil shale, *Permeability, *In situ combustion, Retorts(Reactors), Compacting, Regression analysis, Tests, Temperature.

The Bureau of Mines conducted laboratory experiments to determine the change during retorting in the apparent permeability and the degree of compaction of beds of broken oil shale. Grades of oil shale studied varied from 20.6 to 46.7 gallons of oil per ton and the simulated overburden pressures applied to the shale were from 300 to 900 psi. Linear regression analysis of the data produced equations describing the response of the oil shale. Oil shales of approximately 20 gpt experience only minor apparent permeability reductions under test conditions while richer shales (30 to 50 gpt) lose essentially all permeability. The permeability reductions were accompanied by corresponding decreases in bed height which varied up to 37 percent of original. (Author)

PB-228 688/8GA PC$3.00/MF$1.45
Bureau of Mines, Washington, D.C.
A BUREAU OF MINES DIRECT-READING AZIMUTH PROTRACTOR.
Information circular,
D. D. Bolstad, and M. A. Mahtab. Jan 74, 12p
BuMines-IC-8617
Prepared by Denver Mining Research Center, Colo.

Descriptors: *Geological surveys, *Fractures(Materials), *Measuring instruments, Orientation, Azimuth.

The report describes the construction and use of a direct reading azimuth protractor (DRAP) for measuring fracture orientations in mines, tunnels, or other excavations having a magnetic environment. DRAP allows a rapid and simultaneous measurement of dip and azimuth of dip of a fracture plane. The instrument is rugged, light-weight and easily constructable from standard hardware items. DRAP can measure dip to within plus or minus 0.5 degree and azimuth of dip to within plus or minus 5 degrees of the corresponding values obtained with a Brunton compass. (Author)

PB-228 689/6GA PC$3.25/MF$1.45
Bureau of Mines, Washington, D.C.
GEOLOGIC STRUCTURE ANALYSIS USING RADAR IMAGERY OF THE COAL MINING AREA OF BUCHANAN COUNTY, VA.
Rept. of Investigations,
C. H. Elder, P. W. Jeran, and D. A. Keck. Jan 74, 35p BuMines-RI-7869
Prepared by Pittsburgh Mining and Safety Research Center, Pa.

Descriptors: *Geological surveys, *Side looking radar, *Remote sensing, Structural geology, Mapping, Virginia.
Identifiers: Buchanan County(Virginia).

An analysis of the geologic structure of an area of Buchanan County, Va., was made by the Bureau of Mines using imagery from an airborne AN/APO-97 side-looking radar system to evaluate that mapping technique for delineating structural features which may cause mining problems. Side-looking radar (SLAR) was found to be a useful remote sensing tool for geologic structural analysis. Fault and joint systems identified by lineaments and linear patterns in the imagery were verified by surface and in-mine observations. SLAR imagery accurately delineated structural features that are known to affect gas migration and accumulation and that weakened the rock forming the immediate roof to mine workings, causing mining problems. (Modified author abstract)

PB-228 738/1GA PC$3.25/MF$1.45
Bureau of Mines, Washington, D.C.
ANALYSIS OF FACTORS INFLUENCING FRACTURE INITIATION AND ORIENTATION IN OIL RESERVOIR SANDSTONE.
Report of Investigations,
C. A. Komar, and K-H. Frohne. Jan 74, 28p
BuMines-RI-7813
Prepared by Morgantown Energy Research Center, W. Va.

Descriptors: *Sandstone, *Fracturing, *Oil recovery, Tests, Fractured reservoirs, Earth pressure, Stresses.

Laboratory-scale hydraulic fracture tests were conducted on directionally oriented sandstone material, along with measurements of directional rock properties such as tensile strength, permeability, ultrasonic velocity, and dynamic elastic constants. In these tests, fracture orientation was determined as a function of various combinations of stress, rock saturation, rate of borehole pressurization, and direction of minimum tensile strength relative to minimum horizontal compressive stress. The objective of the experiment was to investigate whether horizontal stresses always controlled the orientation of induced vertical hydraulic fractures, or if under conditions of small differences in stress and/or slow borehole pressurization rates, the induced fracture direction was influenced by directional properties of the rock matrix. (Modified author abstract)

PB-229 182/1GA PC$3.75/MF$1.45
Lamont-Doherty Geological Observatory, Palisades, N.Y.
FACTORS WHICH CONTROL THE DISTRIBUTION OF FERROMANGANESE NODULES AND PROPOSED RESEARCH VESSEL'S TRACK NORTH PACIFIC. PHASE II. FERROMANGANESE PROGRAM NSF/IDOE.
Technical rept.,
D. R. Horn, B. M. Horn, and M. N. Delach. 1973, 65p TR-8 NSF/IDOE-73-56
Grant NSF-GX-33616

Descriptors: *Manganese nodules, *Pacific Ocean, Distribution(Property), Diagenesis, Undersea mineral deposits, Oceanographic surveys.
Identifiers: Clarion fracture zone, Clipperton fracture zone.

The distribution and genesis of nodular ferromanganese deposits between the Clipperton and Clarion Fracture Zones are the principal targets of Phase II, Ferromanganese Program, NSF/IDOE. An inspection of existing data suggests that nuclei or seed grains are the key to nodule distribution and initial stages of growth, not the nodules. Seed grains are most commonly palagonite, a product of unstable basalt reacting to seawater. Therefore, the main control of distribution of nodules is the locations, past and present, of sources of basalt grains which serve as nuclei. Basalt is exposed along the Clipperton and Clarion Fractures and on steep slopes of seamounts between these fractures. Major fields of nodules occur along the fractures and over the flanks and bases of seamounts.

TT-72-56070/02-03 PC$4.50/MF$1.45
Department of the Interior, Washington, D.C.
MINING AND METALLURGY QUARTERLY. NUMBERS 2-3 1972.
1973, 115p
Trans. of Rudarsko-Metalurski Zbornik (Yugoslavia) n2-3 p145-273 1972. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Yugoslavia, *Periodicals, *Mining engineering, Metalliferous mineral deposits, Geochemistry, Coal mining, Mine hoisting, Molybdenum, Concentrating, Iron oxides, Reduction(Chemistry), Coking, Beds(Process engineering), Permeability, Inclusions, Steels, Blasting, Microradiography, Translations.

Contents:
- On the geochemistry of eruptive rocks and ores of Slovenia;
- Trial mining by the Velenje mining method in three slices with storing in the Velenje lignite mine;
- Trial propping with hydraulic sliding roof bars on faces of the Velenje lignite mine;
- Principles of Mathematical optimization of hoisting at variable technical and economical conditions;
- Feasibility of obtaining a molybdenite concentrate from the Majdanpek copper concentrate - procedure, results and problems;
- The influence of Na2CO3 and K2CO3 additives on the reactivity of metallurgical coke;
- Permeability of packed beds;
- Selective microradiography and electron microanalysis of free-cutting steels;
- Miners of the Tajmiste iron ore mine in Macedonia perform the biggest bench blasting in Yugoslavia with 89 tons of explosive.

UCRL-75044 PC$3.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
IN-PLACE LEACHING OF PRIMARY SULFIDE ORES: LABORATORY LEACHING DATA AND KINETICS MODEL.
R. L. Braun, A. E. Lewis, and M. E. Wadsworth. 31 Oct 73, 17p CONF-740202-1

Descriptors: (*Copper ores, *Leaching), Copper sulfides, Nuclear explosions, Sulfuric acid, Underground explosions.

For abstract, see NSA 29 05, number 10109.

8J. Physical Oceanography

AD-774 884/1GA PC$3.75/MF$1.45
Naval Underwater Systems Center New London Conn New London Lab
ATTENUATION OF LOW-FREQUENCY SOUND IN THE OCEAN: NUSC RESEARCH PROGRAM 1967-1972.
Technical rept.,
David G. Browning, and William H. Thorp. 4 Jan 74, 55p Rept no. NUSC-TR-4581

Descriptors: *Underwater sound, *Sea water, Attenuation, Low frequency, Sound transmission, Red Sea, Indian Ocean, Hudson Bay.
Identifiers: Lake Superior, Lake Tanganyika.

During the past five years, the Naval Underwater Systems Center has conducted a series of experiments to study the attenuation of low-frequency sound in sea water. The report reviews each of these investigations and the techniques employed and traces their respective contributions to the current understanding of sound attenuation in the ocean. Experimental evidence suggesting the probable existence in sea water of a relaxational process around one kHz is reinforced by recent laboratory measurements involving boron-borate reactions. Results of measurements in major ocean areas of the world show generally consistent values of low-frequency attenuation, thereby permitting use of simple empirical formulas for adequate prediction at frequencies above 100 Hz. At longer wavelengths, the exact behavior of the coefficients remain poorly defined. (Author)

AD-774 947/6GA PC$4.50/MF$1.45
Old Dominion Univ Norfolk Va Inst of Oceanography
PARTICLE SIZE DISTRIBUTION AND SMALL-SCALE BED-FORMS ON SAND WAVES, CHESAPEAKE BAY ENTRANCE.
Technical rept.,
John C. Ludwick, and John T. Wells. 15 Jan 74, 112p Rept no. TR-12
Contract N00014-70-C-0083

Descriptors: *Chesapeake Bay, *Sand, *Waves, Sediment transport, Ocean bottom topography, Particle size, Texture.

The relationship between sediment texture and topography has been studied along five series of sand waves in Chesapeake Bay entrance, Virginia. Results indicate that two types of distributions are present: sand waves with coarse sediment on crests and fine in troughs, and sand waves with fine sediment on crests and coarse in troughs. Asymmetrical, migrating sand waves exhibit the first type; near-symmetrical, nonmigrating sand waves exhibit the second type. In general, bimodal sediment is present on crests of migrating sand waves and in troughs of stationary sand waves. There is a progressive decrease in percentage of biomodal samples in the Bay entrance sand wave field with distance to the southeast, the direction of net sediment transport. (Modified author abstract)

AD-774 975/7GA Reprint
Woods Hole Oceanographic Institution Mass
NEAR-BOTTOM THERMOCLINE IN THE SAMOAN PASSAGE, WEST EQUATORIAL PACIFIC.
Technical rept.,
Ken C. MacDonald, and Charles D. Hollister. 12 Mar 73, 10p Rept nos. WHOI-74-3, WHOI-Contrib-3073
Contract N00014-66-C-0241
Availability: Pub. in Nature, v243 n5407 p461-462, 22 Jun 73.

Descriptors: *Thermoclines, *Pacific Ocean, Ocean currents, Equatorial regions, Ocean bottom.
Identifiers: Samoan Passage.

A pronounced benthic thermocline was present in all eight of the new temperature profiles taken in the axis of the passage. A temperature decrease of 0.31C (1.37C to 1.06C) occurs over a depth interval of about 250 m at a depth of 4,200 to 4,400 m. Below 4,400 m there is a slight increase in temperature because of adiabatic compression. (Modified author abstract)

AD-774 976/5GA Reprint
Woods Hole Oceanographic Institution Mass
BOTTOM SENSING DEVICE FOR USE WITH STD SYSTEMS.
Technical rept.,
R. A. Knox, and R. C. Millard, Jr. 2 Nov 72, 6p Rept nos. WHOI-74-5, WHOI-Contrib-2747
Contract N00014-66-C-0241, Grant NSF-A-30729
Prepared in cooperation with Massachusetts Inst. of Tech., Cambridge. Dept. of Meteorology. Revision of report dated 3 Oct 72.
Availability: Pub. in Deep-Sea Research, v20 p419-421 1973.

Descriptors: *Oceanographic equipment, Ocean bottom, Switches, Detectors.

A bottom-sensing signal generator, compatible with single-conductor fm systems such as the STD, is described. It is similar to, but somewhat simpler than, the device of Holzkamm (1964). (Author)

AD-775 250/4GA PC$4.75/MF$1.45
Oregon State Univ Corvallis School of Oceanography
CHEMICAL DATA FROM OREGON WATERS 1972,
Richard D. Tomlinson, Lynda Barstow, David R. Standley, Suelynn Williams, and Louis I. Gordon. Sep 73, 126p Rept nos. Ref-73-15, Data-56
Contract N00014-67-A-0369-0007, Grant NSF-GA-12113

Descriptors: *Oceanographic data, *Oregon, *Coastal regions, Pacific Ocean, Salinity, Oxygen, Phosphorus, Carbon dioxide, Nitrogen, Silicates.
Identifiers: Nutrients.

The report presents data collected on six cruises made during the months May-October 1972 along the Oregon coast. Both complete data listings and sequential surface data contour charts are presented. The latter graphically display rapid changes in surface water characteristics on time scales as short as a few hours. (Modified author abstract)

AD-775 261/1GA Reprint
Rosenstiel School of Marine and Atmospheric Science Miami Fla
PRECISE REPRESENTATION OF THE P-V-T PROPERTIES OF WATER AND SEAWATER DETERMINED FROM SOUND SPEEDS,
Dong-Ping Wang, and Frank J. Millero. 22 Jun 73, 7p Rept no. Contrib-1659
Contract N00014-67-A-0201-0013, Grant NSF-GA-17386
Sponsored in part by Grant NSF-GA-27940. Revision of report dated 4 Apr 73.
Availability: Pub. in Jnl. of Geophysical Research, v78 n30 p7122-7128, 20 Oct 73.

Descriptors: *Compression, *Water, *Sea water, Pressure, Temperature, Acoustic velocity, Measurement, Equations of state.

Reliable equations of state for water and seawater have been derived from sound speed measurements by an iterative method.

AD-775 264/5GA Reprint
Rosenstiel School of Marine and Atmospheric Science Miami Fla
COMPRESSIBILITY OF WATER AS A FUNCTION OF TEMPERATURE AND PRESSURE,
Rana A. Fine, and Frank J. Millero. 13 Feb 73, 9p Rept no. Contrib-1691
Contract N00014-67-A-0201-0013, Grant NSF-GA-17386
Availability: Pub. in the Jnl. of Chemical Physics, v59 n10 p5529-5536, 15 Nov 73.

Descriptors: *Compression, *Sea water, Equations of state, Pressure, Temperature, Acoustic velocity.

The isothermal compressibility of water from 0 to 100C and 0 to 1000 bar has been determined from Wilson's sound velocity measurements which have been normalized to Kell's 1 atm values. The isothermal compressibilities determined from the sound velocities have been fit, with a maximum deviation in compressibility of plus or minus 0.016 x 10 to the -6th power/bar, to an extended bulk modulus equation. (Modified author abstract)

AD-775 295/9GA Reprint
Rosenstiel School of Marine and Atmospheric Science Miami Fla
HEAT CAPACITY OF SEAWATER SOLUTIONS FROM 5 TO 35C AND 0.5 TO 22/PARTS PER THOUSAND CHLORINITY,
Frank J. Millero, G. Perron, and J. E. Desnoyers. 14 Mar 73, 9p
Contract Nonr-4008(02), Grant NSF-GA-17386
Prepared in cooperation with Universite de Sherbrooke (Quebec). Dept. of Chemistry. Revision of report dated 23 Jan 73.
Availability: Pub. in Jnl. of Geophysical Research, v78 n21 p4499-4507, 20 Jul 73.

Descriptors: *Sea water, *Specific heat, Salinity.

In the paper the authors present new data on the heat capacity of seawater solutions as a function of temperature (5-35C) and chlorinity (0.552-22.143/parts per thousand). These heat capacities have been determined with a precise flow heat capacity calorimeter that can determine specific heats of aqueous solutions relative to that of pure water.

AD-775 515/0GA PC$3.00/MF$1.45
Washington Univ Seattle Dept of Oceanography
R/V 'THOMAS G. THOMPSON' CRUISE TT-086. SUBTROPICAL FRONT OF THE CENTRAL NORTH PACIFIC 7 JANUARY TO 10 FEBRUARY 1974.
Preliminary rept.,
Gunnar I. Roden. Feb 74, 8p Rept no. Ref-M74-14
Contract N00014-67-A-0103-0014

Descriptors: *Oceanographic data, *Pacific Ocean, Thermoclines, Salinity.
Identifiers: North Pacific Ocean.

The objective of this cruise was to study the thermohaline structure in the subtropical front region of the central North Pacific. (Author)

COM-74-10503/2GA Reprint
Old Dominoin Univ., Norfolk, Va. Inst. of Oceanography.
HOLOCENE EVOLUTION OF THE SHELF SURFACE, CENTRAL AND SOUTHERN ATLANTIC SHELF OF NORTH AMERICA,
Donald J. P. Swift, John W. Kofoed, Francis P. Saulsbury, and Phillip Sears. 1972, 78p NOAA-74020722
Contract DACW72-69-C-0016, Grant NSF-GA-13837
Pub. in Shelf Sediment Transport, Chpt23 p499-574 1972.

Descriptors: *Continental shelves, *Ocean bottom, *Geomorphology, Submarine topography, Sediment transport, Sea level, Atlantic Ocean, Evolution(Development).

The floor of the central and southern Atlantic shelf is a palimpsest or multiple imprint surface. An initial pattern is an erosional one consisting of major transverse shelf valleys and plateaulike interfluves. The dominant pattern is that of constructional topography formed at the foot of the shoreface. This constructional pattern is undergoing modification toward a third pattern in response to the modern hydraulic regime; therefore, the term 'relict' does not seem an adequate descriptor. A unifying concept for the interpretation of Holocene shelf history is that of Bruun coastal retreat. This variant of the equilibrium profile hypothesis states that a rise in sea level over an unconsolidated coast results in shore-face erosion, equivalent to parallel slope retreat, and a concomitant aggradation of the adjacent sea floor. (Modified author abstract)

PATENT-3 104 928 Not available NTIS
Department of the Interior, Washington, D.C.
BATHKYMOGRAPH.
Patent,
Frank J. Hester. Filed 29 Mar 62, patented 24 Sep 63, 8p PAT-APPL-183 682, DOCKET/FWS-559

Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Depth detectors, Pressure gages, Recording instruments, Automatic control, Fishing, Tunas.
Identifiers: PAT-CL-346-72.

This patent relates to a pressure sensing and recording mechanism, and more specifically to an instrument adapted for use in making a record of depth underwater corresponding to the pressure sensed, as a function of time. The instrument has particular utility for making a time based record of the depth reached by a net released or set from a fishing vessel. It also affords an excellent means of verifying predicted tidal extremes. When placed on the sea bottom just prior to an expected high or low tide, the instrument will record accurately both the extreme value and the time of its occurrence.

8K. Seismology

AD-775 388/2GA PC$3.75/MF$1.45
Bolt Beranek and Newman Inc Cambridge Mass Computer Systems Div
A STUDY OF THE DATA COLLECTION, PROCESSING, AND MANAGEMENT SYSTEM FOR A WORLDWIDE SEISMIC NETWORK.
Final technical rept.,
Howard W. Briscoe. 14 Sep 73, 68p* Rept no. BBN-2632
Contract F08606-73-C-0035, ARPA Order-1620

Descriptors: *Seismology, *Communications networks, *Seismic detection, Seismological stations, Seismic waves, Data processing, Underground explosions, Nuclear explosions, Signal processing.
Identifiers: ARPA computer network, ILLIAC 4 computers, *Computer networks, Vela Uniform.

The report presents a recommendation of a system design for a worldwide seismic data network. Particular attention has been paid to recent or imminent developments in the areas of digital communication, processing, and storage. Both sensor stations currently expected to be operational about 1975 and possible future expansion or modification of the network are considered. The major conclusions of the system design are (1) seismic event detection should be done at the array site in the majority of cases, (2) the ARPANET is generally a suitable and cost effective communication facility for seismic data transmission, (3) a communications control center should be established at SDAC in order to coordinate and monitor the seismic data network operation centrally, (4) network event processing can evolve from the existing large array event processing system at SDAC, (5) long period event processing should be done off-line using ARPANET computing resources with special consideration given to eventual use of the ILLIAC IV array processor, and (6) the Datacomputer service can provide an appropriate data management system for the seismic data network. (Author)

PB-229 239/9GA PC$13.25/MF$1.45
California Inst. of Tech., Pasadena. Earthquake Engineering Research Lab.
STRONG-MOTION EARTHQUAKE ACCELEROGRAMS DIGITIZED AND PLOTTED DATA. VOLUME II. CORRECTED ACCELEROGRAMS AND INTEGRATED GROUND VELOCITY AND DISPLACEMENT CURVES. PART G. ACCELEROGRAMS IIG106 THROUGH IIG114,
M. D. Trifunac, A. G. Brady, and D. E. Hudson.
Nov 73, 205p EERL-73-52
Grant NSF-GK-28098
See also PB-224 977/9.

Descriptors: *Earthquakes, *Data processing, Accelerometers, Digital recording, Power spectra, Seismic waves, Velocity measurement, Corrections, Printouts, Tables(Data), California.
Identifiers: San Fernando earthquake.

This issue, Vol. 2, Part G, Report No. EERL 73-52 continues with the accelerograms obtained during the San Fernando Earthquake of Feb. 9, 1971 and includes one record each from Caltech's Seismological Lab. and Athenaeum in Pasadena and the Palmdale Fire Station; and two records each from Caltech's Millikan Library and Jet Propulsion Lab. in Pasadena, and the building at 611 W. Sixth St. in Los Angeles. The uncorrected versions of the accelerograms in this issue appeared earlier in Vol. I, Part G, Report No. EERL 72-20. (Modified author abstract)

PB-229 240/7GA PC$8.25/MF$1.45
California Inst. of Tech., Pasadena. Earthquake Engineering Research Lab.
ANALYSES OF STRONG MOTION EARTHQUAKE ACCELEROGRAMS. VOLUME IV. FOURIER AMPLITUDE SPECTRA. PART E. ACCELEROGRAMS IIE071 THROUGH IIE085,
M. D. Trifunac, A. G. Brady, and D. E. Hudson.
Oct 73, 105p EERL-73-103
Grant NSF-GK-28098
See also PB-223 969.

Descriptors: *Earthquakes, *Data processing, *Seismic waves, *Dynamic structural analysis, Accelerometers, Digital recording, Spectrum analysis, Power spectra, Fourier analysis, Dynamic response, Buildings.
Identifiers: Earthquake engineering, Ground motion, San Fernando earthquake.

This is the fifth report of a series presenting Fourier amplitude spectra for earthquake ground motions and for structural response accelerations. Vol. IV, Part A, Report No. EERL 72-100 included an introduction summarizing Fourier spectrum techniques in earthquake engineering as a background to the use of the data. For each earthquake accelerogram, two spectrum plots are given - a Fourier amplitude spectrum versus frequency on a linear scale, and a log-spectrum, log-frequency plot. In the series, Fourier amplitude spectra will be given for all corrected accelerograms, including buildings response measurements. The corrected records analyzed in this report, Vol. IV, Part E, appeared in Vol II, Part E, Report No. EERL 73-50. Their uncorrected versions were published in Vol. I, Part E, Report No. EERL 71-22. (Author)

PB-229 241/5GA PC$9.75/MF$1.45
California Inst. of Tech., Pasadena. Earthquake Engineering Research Lab.
ANALYSES OF STRONG MOTION EARTHQUAKE ACCELEROGRAMS. VOLUME IV. FOURIER AMPLITUDE SPECTRA. PART F. ACCELEROGRAMS IIF086 THROUGH IIF105.
M. D. Trifunac, A. G. Brady, and D. E. Hudson.
Oct 73, 135p EERL-73-104
Grant NSF-GK-28098
See also PB-229 240.

Descriptors: *Earthquakes, *Data processing, *Seismic waves, *Dynamic structural analysis, Accelerometers, Digital recording, Spectrum analysis, Power spectra, Fourier analysis, Dynamic response, Buildings.
Identifiers: Earthquake engineering, Ground motion, San Fernando earthquake.

This is the sixth report of a series presenting Fourier amplitude spectra for earthquake ground motions and for structural response accelerations. Vol. IV, Part A, Report No. EERL 72-100 included an introduction summarizing Fourier spectrum techniques in earthquake engineering as a background to the use of the data. For each earthquake accelerogram, two spectrum plots are given - a Fourier amplitude spectrum versus frequency on a linear scale, and a log-spectrum, log-frequency plot. In the series, Fourier amplitude spectra will be given for all corrected accelerograms, including building response measurements. The corrected records analyzed in this report, Vol. IV, Part F, appeared in Vol. II, Part F, Report No. EERL 73-51. Their uncorrected versions were published in Vol. I, Part F, Report No. EERL 71-23. (Author)

8L. Snow, Ice, and Permafrost

AD-775 249/6GA PC$6.00/MF$1.45
Texas A and M Univ College Station Remote Sensing Center
RADAR STUDIES OF ARCTIC ICE AND DEVELOPMENT OF A REAL-TIME ARCTIC ICE TYPE IDENTIFICATION SYSTEM.
Final rept., Sep 71-Jun 73,
J. W. Rouse, Jr., J. A. Schell, and J. A. Permenter.
Jun 73, 244p Rept no. RSC-835-6
Contract N60921-72-C-0076

Descriptors: *Sea ice, *Arctic regions, Identification, Classification, Radar signals, Electromagnetic scattering, Signal processing, Ice reporting, Analog systems, Models, Computer programming, Performance(Engineering), Circuits, Backscattering, Microwaves, Measurement, Radar signatures, Real time.
Identifiers: Point Barrow(Alaska), *Remote sensing, Design.

Studies were conducted to develop a real-time Arctic ice type identification system. Data obtained by NASA Mission 126, conducted at Pt. Barrow, Alaska (Site 93) in April 1970 was analyzed in detail to more clearly define the major mechanisms at work affecting the radar energy illuminating a terrain cell of sea ice. General techniques for reduction of the scatterometer data to a form suitable for application of ice type decision criteria were investigated, and the electronic circuit requirements for implementation of these techniques were determined. Also, consideration of circuit requirements are extended to include the electronics necessary for analog programming of ice type decision algorithms. After completing the basic circuit designs a laboratory model was constructed and a preliminary evaluation performed. Several system modifications for improved performance are suggested. (Modified author abstract)

AD-775 381/7GA PC$6.50/MF$1.45
Cold Regions Research and Engineering Lab Hanover N H
INVESTIGATIONS PERFORMED ON THE ARCTIC ICE DYNAMICS JOINT EXPERIMENT MARCH 1971.
Research rept.,
S. F. Ackley, W. D. Hibler, III, A. Kovacs, W. F. Weeks, and A. Hartwell. Dec 73, 67p Rept no. CRREL-RR-315
ARPA Order-1615

Descriptors: *Arctic Ocean, *Sea ice, Dynamics, Strain(Mechanics), Pack ice, Topography, Deformation.
Identifiers: *Beaufort Sea.

Contents:
- Mesoscale strain measurements on the Beaufort Sea pack ice;
- Structure of a multiyear pressure ridge;
- Top and bottom roughness of a multiyear ice floe;
- Airphoto analysis of ice deformation in the Beaufort Sea;
- Data on morphological and physical characteristics of sea ice in the Beaufort Sea.

8M. Soil Mechanics

AD-774 863/5GA PC$4.00/MF$1.45
Army Engineer Waterways Experiment Station Vicksburg Miss
AN EVALUATION OF THE THERMOCOUPLE PSYCHROMETRIC TECHNIQUE FOR THE MEASUREMENT OF SUCTION IN CLAY SOILS.
Final rept.,

Lawrence D. Johnson. Jan 74, 81p Rept no. AEWES-TRqS-74-1

Descriptors: *Soil mechanics, *Clay, *Pore pressure, Hygrometers, Thermocouples.
Identifiers: *Psychrometers, Soil properties.

Suction or negative pore water pressure is important in controlling the physical properties of less than fully saturated soils. Methods for the accurate measurement of a wide range of suctions in such soils are not well known and are under development. This study to evaluate thermocouple psychrometers as a technique for the measurement of suction was initiated because these devices are relatively inexpensive, simple to use, allow rapid measurements, and possess a large range. Apparatus was designed, constructed, and tested for the thermocouple psychrometric measurement of suction pressure in clay soils without the need for precise temperature control. This report reviews the background literature leading to the development of the apparatus, describes the equipment, and outlines procedures for making psychrometric measurements. Suction measurements of Yazoo clay from Jackson, Mississippi, and clay from the weathered Upper Midway formation, Lackland Air Force Base, Texas, support the definition that total suction is the sum of matrix and osmotic components. (Modified author abstract)

AD-775 113/4GA PC$9.25/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
MECHANICS OF SOLID DEFORMABLE BODIES,
V. N. Nikolaevskii. 14 Jan 74, 124p Rept no. FTD-MT-24-825-73
Edited machine trans. of Itogi Nauki Tekhniki: Mekhanika Tverdykh Deformiruemykh Tel. Mekhanicheskie Svoistva Gruntov i Teoriya Plastichnosti (USSR) v6 p1-85 1972, by Robert D. Hill.

Descriptors: *Soil mechanics, Soil dynamics, Deformation, Elastic properties, Soils, Translations, USSR.

The report gives an analytical survey of the contemporary state of soil mechanics and those sections of the theory of plasticity in which internal dry friction is examined. Given briefly are basic concepts about the process of the deformation of granulated media which belong to Coulomb and Reynolds and also the known achievements of the statics of friable media. A large number of proposed models of plastic deformation is analyzed in much greater detail and compared with experimental data. (Modified author abstract)

AD-775 162/1GA PC$4.25/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
OPERATION MIXED COMPANY/SHOT MC III, OPERATION MIDDLE GUST/SHOT MG V PROJECT LN307 SOIL RESISTIVITY MEASUREMENTS,
E. E. Bliamptis. 1974, 23p AFCRL-TR-74-0035
Proceedings of the MIXED COMPANY/MIDDLE GUST Results Meeting 13-15 Mar 73.

Descriptors: *Soil tests, *Underground explosions, Nuclear explosion testing, Simulation, Site selection, Boreholes, Rock mechanics, Soil dynamics, Electrical resistivity.
Identifiers: Mixed Company 3 shot, Middle Gust 5 shot.

Ground resistivity measurements were made at Mixed Company 3 and Middle Gust 5 test sites using the Geophysical Measurement Array method. The average electrical resistivity of the Mixed Company site was 76.7 Ohm meter. The average resistivity of the Middle Gust site was 44.7 Ohm meter. Both sites had received substantial precipitation preceding the measuremeents. The passage of the explosion produced stress wave modulated the resistivity of the sample material by 11%. It is thus possible to monitor the state of stress of very large material samples in situ by monitoring their electrical resistivity. (Author)

AD-775 587/7GA Reprint
Army Electronics Command Fort Monmouth N J
THE APPLICATION OF THE THEORY OF HETEROGENEOUS DIELECTRICS TO LOW SURFACE AREA SOIL SYSTEMS,
Douglas C. Pearce, William H. Hulse, Jr., and John W. Walker. 20 Sep 72, 5p
Availability: Pub. in IEEE Transactions on Geoscience Electronics, vGE-11 n4 p167-170 Oct 73.

Descriptors: *Soils, *Electromagnetic properties, Dielectrics.

A theory of a three component heterogeneous dielectric has been developed to provide a basis for an analytic description of the electromagnetic properties of soil systems. The theory is valid for frequencies where the electromagnetic wavelength is much greater than the particle size. Essential parameters of the theory are the amounts and properties of the separate constituents. Agreement between theory and experiment for low surface area sand systems at both audio and p-band radar frequencies is demonstrated. (Author)

N74-15051/7GA PC$3.75/MF$1.45
Rima (Alessandro), Muralto (Switzerland).
MAXIMUM AND MINIMUM TEMPERATURES TO DEPTHS OF 1.60 M IN GRANULATED SOILS AT BELLINZONA FOR 1965 TEMPERATURA MASSIMA E MINIMA FINO ALLA PROFONDITA DI 1,60 M, DEL MISTO GRANULARE A BELLINZONA NEL 1965.
A. Rima. Jan 73, 33p RI/SM/25
Language in Italian.

Descriptors: *Soil science, *Temperature measurement, Annual variations, Frost, Heat exchangers, Isotherms.

For abstract, see STAR 1206

8N. Terrestrial Magnetism

N74-15062/4GA PC$3.50/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
AVERAGE HIGH LATITUDE MAGNETIC FIELD: VARIATIONS WITH INTERPLANETARY SECTOR AND WITH SEASON. 2: COMPARISON OF DISTURBANCE LEVELS AND DISCUSSION OF IONOSPHERIC CURRENTS.
R. Langel, and N. Brown. 1973, 26p NASA-TM-X-70563, X-645-73-380

Descriptors: *Interplanetary magnetic fields, *Ionospheric currents, *Ionospheric disturbances, *Polar regions, Annual variations, Interplanetary space, Magnetic disturbances.

For abstract, see STAR 1206

9. ELECTRONICS AND ELECTRICAL ENGINEERING

9A. Components

AD-774 822/1GA PC$3.25/MF$1.45
Hughes Aircraft Co Torrance Calif Electron Dynamics Div
BROADBAND TRANSMITTER TUBE.
Triannual rept. no. 4, 1 Jul-30 Oct 73,
A. E. Manoly. Jan 74, 26p Rept no. EDD-W-5262-4 ECOM-0294-4-72
Contract DAAB07-72-C-0294
See also report dated Nov 73, AD-771 996.

Descriptors: *Traveling wave tubes, Broadband, Electron guns, Helixes, Ku band, Microwave tubes, Slow wave circuits, C band.

Cold test data was taken for the Ku-Band figure 8 circuit structure. Impedance, phase velocity and dielectric loading factor were measured. Dual beam electron gun design studies were performed. An electrolytic tank was used to determine the initial gun design. Electron trajectories along with beam characteristics were evaluated using a digital computer program. (Author)

AD-774 830/4GA PC$4.00/MF$1.45
Hughes Aircraft Co Carlsbad Calif Industrial Products Div
STORAGE CAMERA TUBE WITH NON-DESTRUCTIVE READOUT.
Quarterly progress rept. no. 1, 1 Jul-30 Sep 73,
L. S. Yaggy. Jan 74, 20p ECOM-0330-1-73
Contract DAAB07-73-C-0330

Descriptors: *Camera tubes, Storage tubes, Lasers, Television cameras.

The report describes the progress to develop a novel camera-tube capable of dual-mode operation, either as a real-time television camera-tube or as a storage camera tube with non-destructive readout, switchable upon command. Investigations of the target and electron gun for the storage camera-tube are in progress. The geometry of the initial targets proved to be suitable for dual-mode operation. The overall tube configuration is relatively firm, and parts drawings were completed. Calculations predict adequate sensitivity at 1.06 micrometers wavelength with a target-thickness consistent with resolution requirements. (Modified author abstract)

AD-775 000/3GA PC$3.75/MF$1.45
Ford Motor Co Dearborn Mich Scientific Research Staff
ABSORPTION LOSSES IN EPITAXIAL PBTE FILMS FOR POTENTIAL INTEGRATED OPTICS APPLICATION.
Final technical rept. 1 Oct-31 Dec 73,
W. H. Weber, S. L. McCarthy, and M. Mikkor.
Feb 74, 54p
Contract N00014-73-C-0289, ARPA Order-2327

Descriptors: *Integrated circuits, *Semiconductor lasers, Semiconducting films, Thin films, Lead compounds, Tellurides, Optical properties, Gain, Light transmission, Absorption(Physical).
Identifiers: *Optical waveguides, *Lead tellurides.

Optical absorption measurements at 300 K and 77K in the 2.5-12 micrometer range are presented for epitaxial PbTe films grown on BaF2 substrates. Effects due to carrier concentrations, growth conditions, and possible impurities are discussed. In high carrier concentration films ($p > or = 10$ to the 18th power/cc) the absorption is free-carrier limited, while in low p material the absorption appears to be impurity limited. The impurity limited absorption, which shows wide variations between samples, correlates with the observation of Cl in the ion back-scattering spectra. The lowest observed 10 micrometer loss is 16/cm. A threshold analysis on PbTe diode lasers made with annealed samples indicates the threshold gain is 10-20/cm, about a factor of 10 below that obtained in similar laser in unannealed films. (Author)

AD-775 206/6GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
A PHOTORESIST FILM APPLICATOR FOR LONG AND FRAGILE CRYSTAL SUBSTRATES,
Martin R. Stiglitz, and William J. Kearns. 23 Jul 73, 3p Rept no. AFCRL-TR-74-0068
Revision of report dated 21 Jun 73.
Availability: Pub. in Review of Scientific Instruments, v44 n11 p1671-1672 Nov 73.

Descriptors: *Photolithography, *Crystal growth, *Acoustic filters, *Acoustic delay lines, Acoustic waves, Surface waves, Germanium compounds, Bismuth compounds, Oxides, Substrates.
Identifiers: Bismuth oxides, Germanium oxides, *Acoustic surfaces waves, *Microwave acoustics.

Long and fragile crystal substrates can be processed in a drawing device that produces uniform photoresist coatings on them. The film thickness can be varied with the pulling speed, from 2500 to 4300 A in a single pull. Thickness uniformities of plus or minus 80 A over the entire surface have been obtained. (Author)

AD-775 252/0GA PC$3.25/MF$1.45
Michigan Univ Ann Arbor Radio Astronomy Observatory
ANTENNA ARRAYS: DESIGN AND THEORY FOR RADIO PULSAR TIMING MEASUREMENTS.
Final rept. 1 Mar 71-31 Aug 73,
Jess Scott. 15 Feb 74, 39p Rept no. UM/RAO-1974-1
Contract N00014-67-A-0181-0037

Descriptors: *Antenna arrays, *Pulsars, *Extraterrestrial radio waves, *Time studies, Radio astronomy.
Identifiers: Design.

A study was made of published radio data on 57 pulsars to determine specifications for an antenna and receiver system for the precise timing of pulsar pulses. The study attempted to optimize the frequency choice, the receiver system, and array size for a given choice of pulsars and timing error. An approximate theory was developed to relate antenna area and pulsar parameters to the timing error. The theory was tested against the pulsar data. Then an array was specified which would give a timing error of less than 100 microsec on 15 pulsars. These results could be used in a feasibility study of a portable navigation system dependent only upon natural extraterrestrial radio signals. (Author)

AD-775 267/8GA Not available NTIS
Mcmaster Univ Hamilton (Ontario) Dept of Electrical Engineering
THE 'PARALLEL BAR' BUBBLE PROPAGATING CIRCUIT.
Edward Della Torre, and W. Kinsner. 17 May 73, 6p
Presented at the 1973 INTERMAG Conference Held in Washington, D.C. 24-27 Apr 73. Revision of report dated 2 Apr 73.
Availability: Pub. in IEEE Transactions on Magnetics, vMAG-9 n8 p298-303 Sep 73.

Descriptors: *Magnetic circuits, Magnetic materials, Magnetic domains, Magnetic devices, Bubbles, Canada.
Identifiers: *Magnetic bubble domains, Permalloys.

A single-phase transverse-field bubble propogating circuit is discussed. Bar shape difference, with corresponding demagnetizing factor difference, is used to convert alternating applied field into a travelling magnetic wave. A computer analysis was carried out using a simplified model for the Permalloy magnetization process. Good agreement is achieved between these predictions and experimental observations. (Author)

AD-775 382/5GA PC$4.00/MF$1.45
General Electric Corporate Research and Development Schenectady N Y
MICROWAVE FIELD EFFECT TRANSISTOR DEVELOPMENT.
Final technical rept.,
Herbert Goronkin. Jan 74, 80p RADC-TR-73-374
Contract F30602-72-C-0371

Descriptors: *Field effect transistors, Microwave equipment, Schottky barrier devices, Silicon, Fabrication, Junction transistors.

The purpose of the program was to fabricate a 10-watt F-Band field effect transistor. Two approaches were taken. The multiple mask approach was found to be cumbersome and generally difficult to execute for a 2.5 micron geometry device. Rather than pursue this approach, a second design was initiated which involved self-registration of the source and drain with respect to the gate by means of a selective epitaxial region which comprises the electrical channel. Due to several unanticipated process difficulties (for which solutions have been identified) time did not allow for completion of the fabrication portion of the FET-11 effort. Preliminary findings indicate that the approach is feasible and should be expected to yield microwave power field effect transistors. (Author)

AD-775 410/4GA PC$3.75/MF$1.45
Polytechnic Inst of Brooklyn Farmingdale N Y Dept of Electrical Engineering/Electrophysics
VHF-UHF SURFACE WAVE STUDIES.
Final rept. 1 Jul 71-30 Jun 73,
H. L. Bertoni, and T. Tamir. Jan 74, 58p Rept no. PIBEP-73-133 ECOM-0328-F-71
Contract DAAB07-71-C-0328

Descriptors: *Transducers, *Surface waves, Very high frequency, Ultrahigh frequency, Rayleigh waves.
Identifiers: Wedge transducers, Grating transducers, Design.

An analysis of wedge and grating transducers for elastic surface waves is presented based on viewing the transducer as a surface-wave detector. The analysis is then used to find the design criteria and operating characteristics, such as efficiency and band-width, of grating transducers for Rayleigh waves. When operating as a detector, the surface wave incident on the portion of the substrate covered by the wedge or grating is converted into a leaky wave that radiates one or more beams into the wedge or substrate, one of which is detected by a bulk-wave transducer. Besides giving insight into the operation of these transducers, the analysis based on the detector point of view is valid for cases, such as the Rayleigh-wave grating transducer, where more than one radiated beam is present. The design and operating characteristics of grating transducers are determined. (Modified author abstract)

AD-775 476/9GA PC$4.50/MF$1.45
Cts Knights Inc Sandwich Ill
PRECISION SSB CRYSTAL UNITS.
Final technical rept.,
John F. Silver, and James B. Migas. Dec 73, 103p ECOM-0198-F-73
Contract DAAB07-71-C-0198
See also AD-751 748.

Descriptors: *Quartz resonators, Crystals, Quartz, Resonators, Precision, Sidebands, Single sideband communications.

The report deals with the history, theoretical model, and derived postulates of design, processing, and measurement of fundamental mode 5 MHz quartz crystal resonators capable of reaching an aging rate of 2 x 10 to the minus 10th power per week within eight weeks and withstanding wide range temperature cycling with no more than plus or minus 1 x 10 to the minus 8th power permanent shift in frequency per temperature cycle. Experimental work has been limited to attempts to replace bonding cements with electroplated nickel bonds and thereby obtain optimal advantage from the higher temperature processing capabilities so afforded. The results of this work are generally promising. (Author)

AD-775 523/4GA Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
ENVIRONMENTAL FACTORS GOVERNING FIELD RELIABILITY OF PLASTIC TRANSISTORS AND INTEGRATED CIRCUITS,
Bernard Reich, and Edward B. Hakim. 1972, 7p
Availability: Pub. in IEEE Annual Proceedings Reliability Physics (10th), p82-87 1972, Rept. no. 72CH0628-8-PHY.

Descriptors: *Semiconductor devices, *Integrated circuits, *Encapsulation, *Plastics, Transistors, Microcircuits, Reliability(Electronics), Environmental tests.

The paper describes results of tests performed under field conditions and compares these results with data obtained from accelerated laboratory testing. A model is developed for plastic encapsulated semiconductors relating failure rate and the sum of temperature and relative humidity. With this relationship, accelerated temperature-humidity tests can be applied to predict field failure rates of plastic encapsulated transistors and integrated circuits. (Author)

AD-775 539/0GA Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
THE SILVER/SILVER IODIDE/SILVER THERMOCELL,
Herbert F. Hunger. 6 Apr 73, 6p
Revision of report dated 5 Nov 71.
Availability: Pub. in Jnl. of the Electrochemical Society, v120 n9 p1157-1161 Sep 73.

Descriptors: *Thermochemistry, *Silver, *Silver iodide, *Thermocouples, Thermomechanics, Equations.

In this paper, a mechanistic treatment of the Ag/AgI/Ag thermocell is presented, with the homogeneous thermoelectric effect assumed to be due to Ag(+) transport and the heterogeneous thermoelectric effect to Ag(+) concentration differences (strain-induced) at the electrodes.

AD-775 540/8GA Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
STACKED-CRYSTAL FILTERS,
Arthur Ballato, and Theodore Lukaszek. 21 Jun 73, 3p
Revision of report dated 30 May 73.
Availability: Pub. in Proceedings of the IEEE, v61 n10 p1495-1496 Oct 73.

Descriptors: *Microwave filters, *Band pass filters, *Acoustic filters, Acoustic waves, Surface waves, Quartz resonators, Piezoelectric crystals.

A novel filter device, employing bulk acoustic waves, has been demonstrated experimentally. Inherently simple in construction, miniature and robust, it provides bandwidths of several percent at HF with low insertion loss. (Author)

AD-775 543/2GA Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
WHO WANTS RELIABLE PLASTIC SEMICONDUCTORS,
E. B. Hakim, G. Malinowski, and R. Holevinski. 1973, 7p
Availability: Pub. in unidentified journal, p230-235.

Descriptors: *Semiconductor devices, *Integrated circuits, *Encapsulation, *Plastics, Transistors, Reliability(Electronics), Environmental tests.

It has been found that a tri-layer metal contact system, consisting of platinum silicide-titanium-platinum-gold, is at least a factor of five better than a comparable aluminum metalized device with respect to humidity. However, all gold metalized devices are not necessarily this good; an example is given. To evaluate bond integrity, a liquid-to-liquid thermal shock is used followed by a high temperature parameter readout. Data is presented from long-term life tests which indicate that reliable plastic devices are not adversely effected after five cycles of thermal shock. Also

presented is data indicating acceleration factors for salt atmosphere testing of silicone packages. Finally, problems with procurement of reliable plastic encapsulated semiconductors are discussed from a user's viewpoint. (Author)

ANL-CT-73-16 PC$3.50/MF$1.45
Argonne National Lab., Ill. (Usa).
LONG-TERM STABILITY OF ALNICO 5 AND 8 MAGNETS AT 700 TO 1200 EXP 0 F.
G. A. Forster. Nov 73, 29p

Descriptors: (*Sodium, *Liquid flow), (*Flowmeters, Sodium), (*Permanent magnets, *Performance testing), Alnico alloys, High temperature, Liquid metals, Stability.

For abstract, see NSA 29 05, number 10289.

CEA-CONF-2373 PC$3.25/MF$1.45
Cea Centre d'Etudes Nucleaires de Grenoble, 38 (France). Lab. D'Electronique et de Technologie de l'Informatique.
VALORIZATION OF MOS TECHNOLOGIES BY THE USE OF IONIC IMPLANTATION.
J. Bernard. 15 Feb 73, 22p CONF-730132-1
In French. U.S. Sales Only.

Descriptors: (*Mos transistors, *Fabrication), Integrated circuits, Ion implantation.

For abstract, see NSA 29 05, number 12441.

N74-15103/6GA PC$3.25/MF$1.45
National Aerospace Lab., Tokyo (Japan).
APPLICATION OF INTEGRATED CIRCUIT OPERATIONAL AMPLIFIERS TO TURBULENCE INTERMITTENCY METERS.
T. Watanuki, and J. Sato. 1973, 21p NAL-TR-322
In Japanese: English Summary.

Descriptors: *Operational amplifiers, *Turbulence meters, Boundary layer transition, Integrated circuits, Intermittency, Phase shift, Turbulent boundary layer.

For abstract, see STAR 1206

PATENT-2 974 184 Not available NTIS
Department of the Interior, Washington, D.C.
BUNDLE CONDUCTOR SPACER.
Patent,
Richard J. Mather. Filed 19 Aug 58, patented 7 Mar 61, 3p PAT-APPL-756 050, DOCKET/BPA-289
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Spacers, *Patents, Power transmission lines, High voltage.
Identifiers: PAT-CL-174-40.

The patent describes a device for uniformly spacing conductors of three-phase high voltage transmission lines.

PATENT-3 783 354 Not available NTIS
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
PHASE PROTECTION SYSTEM FOR AC POWER LINES.
Patent.
W. J. Wong. Patented 1 Jan 74, 5p NASA-CASE-MSC-17832-1,
Misc-Filed 29 Sep. 1972 Supersedes N72-33232 (10 - 24, p 3195). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Alternating current, *Circuit protection, *Phase detectors, *Transmission lines, Electric relays, *Patents, Transducers.

The system described provides protection for phase sensitive loads from being or remaining connected to ac power lines whenever a phase reversal occurs. It comprises a solid state phase detection circuit, a dc power relay circuit, an ac-to-dc converter for energizing the relay circuit, and a bistable four terminal transducer coupled between the phase detection circuit and the power relay circuit, for controlling both circuits.

9B. Computers

AD-774 767/8GA PC$4.75/MF$1.45
Massachusetts Inst of Tech Cambridge Project Mac
MACSYMA REFERENCE MANUAL. VERSION 6,
Richard A. Bogen. Jan 74, 144p
Contract N00014-70-A-0362-0006
Second printing of Version 6 of Project MAC's SYmbolic MAnipulation System (MACSYMA).

Descriptors: *Computer programming, *Instruction manuals, Mathematical analysis.
Identifiers: MAC project, MACSYMA computer program, LISP programming language, PDP-10 computers, *Programming manuals.

MACSYMA (Project MAC's SYmbolic MAnipulation System) is a large computer program developed by the Mathlab group of Project MAC's Automatic Programming Division. It is written in LISP (Mn1) and runs under the ITS time sharing system (Ea1) on a DEC PDP-10 computer at Project MAC, MIT. MACSYMA has capabilities for manipulating algebraic expressions involving numbers, variables, and functions. It can differentiate, integrate, take limits, solve equations, factor polynomials, expand functions in power series, plot curves, etc. In addition there are facilities for manipulating lists, subscripted variables, equations, and matrices with many of the usual operations on them being available. The user can also create his own functions and he can extend existing functions and operators. This manual is intended to be a complete reference to the principal features of MACSYMA as of the date shown on the cover.

AD-774 798/3GA PC$4.50/MF$1.45
Army Electronics Command Fort Monmouth N J
COMPUTER TEST FACILITY.
Final rept.,
John M. Cole, Edward J. Beach, Jerjes H. Gil De Gibaja, John W. Hollister, and Jerry A. Kastning. Feb 74, 101p Rept no. ECOM-4199

Descriptors: *Data processing equipment, *Test facilities, Input output devices, Interfaces, Printers(Data processing), Display systems, Plotters, Punched card readers, Random access computer storage, Logic circuits, Computer programs.
Identifiers: PDP 8/I computer system, PDP 8 computers, BORAM(Block Oriented Random Access Memories), Block oriented random access memories, Tape punches.

The Computer Test Facility subtask was initiated to provide a test bed for new ADP equipments being developed by the Computer Techniques Team and to provide a training center for new engineers to allow them to make a successful transition from an academic to an R and D environment. The tasks performed in the Computer Test Facility and described in this document represent the achievement of these two goals. The interface design and implementation, both hardware and software, are described for peripheral devices, e.g., line printers, alphanumeric display, x-y plotters, card readers, high speed paper tape readers, etc., computer-to-computer interface, operating systems, and state-of-the-art tertiary stores. (Author)

AD-774 841/1GA PC$3.00/MF$1.45
Army Research Inst for the Behavioral and Social Sciences Arlington Va
ALPHA-DOT: A NEW APPROACH TO DIRECT COMPUTER ENTRY OF BATTLEFIELD DATA,
Raymond C. Sidorsky. Jan 74, 24p Rept no. ARI-Technical paper-249

Descriptors: *Input output devices, *Tactical warfare, Data processing, Real time, Tactical communications, Keyboards, Man machine systems, Army operations.
Identifiers: Alpha dot system.

The purpose of the present study was to determine the suitability of the 5 key Alpha-dot keyboard for source data automation of battlefield information. The Alpha-dot system is a coding technique that enables people to input data using familiar shapes in a form that is also directly compatible with computers and other binary data processors. The technique can be used as the basis for a number of devices and procedures for the two-day communication of information between man and machine. Ten enlisted personnel entered both free form and formatted versions of simulated enemy situation spot reports. Learning time as well as rate and accuracy of data entry using the Alpha-dot keyboard was compared to operator performance using a standard typewriter. The Alpha-dot technique appears to have potential as a means to increase the speed, accuracy and flexibility of input of battlefield data by frontline observers. Functional specifications for a militarized field operable unit will be developed following field tests of a prototype unit. (Modified author abstract)

AD-774 849/4GA PC$3.75/MF$1.45
Army Construction Engineering Research Lab Champaign Ill
USER MANUAL FOR LIFE1 COMPUTER PROGRAM.
Final rept.,
J. Willmer, P. McManus, and E. Marvin. Jan 74, 54p* Rept no. CERL-TR-S-28

Descriptors: *Pavements, *Landing fields, *Computer programming, User needs, Digital simulation, Landing fields, Foundations(Structures), Maintenance, Decision making, FORTRAN.
Identifiers: LIFE1 computer program, *Design criteria.

The report describes a digital computer program that enables airfield-pavement designers and planners to analyze the consequences of available decision alternatives. The program allows different design schemes and strategies for maintaining the proposed pavement systems. Costs of construction and maintenance are estimated, and the various combinations of design schemes and maintenance strategies are ranked by total costs over the design-life of the pavement. Instructions are provided for program operation and input preparation for use with CDC 6000 series computer systems. The program is written in FORTRAN Extended. (Author)

AD-774 857/7GA PC$3.00/MF$1.45
Defence and Civil Inst of Environmental Medicine Downsview (Ontario)
PROBLEMS IN SOFTWARE DEVELOPMENT.
Research paper,
V. K. Taylor. Apr 73, 14p Rept no. DCIEM-RP-900

Descriptors: *Computer programming, Reviews, Programming languages, Canada.

In the early days of electronic digital computers, development of software was confined to the development of individual applications programs written in machine code. Since then, as computers have become faster and more powerful, the central computer has been viewed through ever increasing layers of systems software to such an extent that now the architecture of the central computer is often lost from view. The investment in software for a new system may be as great as the investment in hardware. However, the problems

involved in the software development may be considerably greater. To develop larger software systems, better tools are required. This paper attempts to highlight tools which are available and to indicate problems inherent in their use. Some speculative ideas are presented concerning the direction in which software research might be oriented to enable us to overcome current difficulties. (Author)

AD-774 903/9GA PC$3.00/MF$1.45
Illinois Univ Urbana Coordinated Science Lab
HIGH DENSITY OPTICAL MEMORY.
Quarterly progress rept. Oct-Dec 73.
Feb 74, 8p
Contract N00014-67-A-0305-0015

Descriptors: *Memory devices, *Crystals, Thermoelectric cooling, Multiple operation, Colors, Potassium compounds, Chlorides.
Identifiers: *Optical crystal memories, Potassium chloride.

Contents:
Thermoelectric cooling;
Multi-address operation;
Long time cycling test;
Electron coloration;
Additive coloration.

AD-774 941/9GA PC$3.25/MF$1.45
Massachusetts Univ Amherst Dept of Computer and Information Science
DESIGN OF SEMANTICALLY DIRECTED VISION PROCESSOR.
Technical rept.,
Edward M. Riseman, and Allen R. Hanson. Jan 74, 38p Rept no. COINS-TR-74C-1
Contract N00014-67-A-0230-0007

Descriptors: *Pattern recognition, Visual perception, Artificial intelligence, Semantics.
Identifiers: *Scene analysis.

Most vision research to date has been applied in highly constrained environments consisting primarily of objects with straight lines, simple shape, little texture, and no color. Many of the techniques developed are going to be of little help in machine perception of natural outdoor scenes. This paper discusses the preliminary design of a semantically directed vision processor. This design allows low level visual features (e.g., motion and edge detectors, texture and color descriptors, etc.) to be interfaced with high level conceptual knowledge (e.g., trees stem from the ground, are below the sky, and are not very mobile) in the perception of complex images. The proposed system will employ some of the standard techniques of pattern recognition coupled with semantic information structured for scene analysis. (Modified author abstract)

AD-774 969/0GA PC$5.75/MF$1.45
University of Southern California Los Angeles Image Processing Inst
IMAGE PROCESSING SOFTWARE DOCUMENTATION.
Technical rept.,
William K. Pratt, James M. Pepin, Guner Robinson, and Mark Sanders. Dec 73, 201p* Rept no. USCIPI-500
Contract F08606-72-C-0008, ARPA Order-1706

Descriptors: *Computer programming, Data processing, Signal processing, FORTRAN, Instruction manuals, Computer programming, Images.
Identifiers: IBM 360/44 computers, HP 2100 computers, *Image processing.

The report contains descriptions of image processing software developed by the University of Southern California Image Processing Institute. Also included are operational descriptions of the IBM 360/44 and the HP-2100 computer system used in image processing. (Author)

AD-775 014/4GA PC$7.25/MF$1.45
Naval Postgraduate School Monterey Calif
A MICROPROGRAMMED I/O INTERFACE.
Master's thesis,
Raimundo Nonato Daniel Duarte. Mar 74, 83p

Descriptors: *Communications networks, *Input output devices, Interfaces, Computer programs, Data processing terminals, Theses.
Identifiers: *Computer networks.

The thesis presents a basic hardware model suitable for most sequential microprogrammed devices. A software system is described which allows the use of an assembly-level programming language instead of the binary representation of microcodes. The implementation of a microprogrammed input/output interface is presented as an example for use of both the hardware and software. (Author)

AD-775 107/6GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
COMPLEXES OF MINICOMPUTERS AND THEIR APPLICATION (M-6000/6010).
V. G. Vinokurov, V. M. Kostelyanskii, A. A. Novokhatnii, and V. V. Rezanov. 1 Feb 74, 18p Rept no. FTD-HT-23-548-74
Edited trans. of Uprazlyayushchie Sistemy i Mashiny (USSR) n1 p128-132 Sep/Oct 72, by Charles T. Ostertag, Jr.

Descriptors: *Minicomputers, *Computer applications, *USSR, Translations, Data processing equipment.
Identifiers: M-6000 minicomputers, M-6010 minicomputers.

AD-775 143/1GA PC$4.75/MF$1.45
Mitre Corp Bedford Mass
REMOTE-TERMINAL EMULATOR (DESIGN VERIFICATION MODEL). VOLUME 7. DATA REDUCTION PROGRAM.
Technical rept.,
M. C. Sarajian. Jan 74, 132p Rept no. MTR-2677-Vol-7 ESD-TR-73-355
Contract F19628-73-C-0001
See also Volume 4, AD-772 820.

Descriptors: *Computer programming, *Minicomputers, Performance(Engineering), Test methods, Computerized simulation, Real time.
Identifiers: DATAR computer program, NOVA 800 minicomputers, Computer networks, Performance evaluation.

A Design Verification Model (DVM) of a Remote-Terminal Emulator which measures the performance of multiterminal computer systems has been developed on a Data General Corporation NOVA 800 minicomputer system. The DVM real-time system software is supported by several non-real-time processors. This volume describes the design, implementation, and usage of the Data Reduction proggram (DATAR) used to process log tape data gathered during an emulator test run. The program produces general statistics, a histogram of percent of responses, and a variety of listings. (Author)

AD-775 145/6GA PC$3.25/MF$1.45
Harvard Univ Cambridge Mass
NETWORKING AND GRAPHICS RESEARCH.
Final rept. 1 Sep 71-30 Sep 73,
Thomas E. Cheatham, Jr. Jan 74, 27p ESD-TR-74-57
Contract F19628-71-C-0174

Descriptors: *Computer graphics, *Communications networks, *Interactive graphics, Computer programming.
Identifiers: PDP-1 computers, PDP-10 computers, ARPA computer network, Computer networks, Interactive computer graphics, Automatic programming.

The report describes the results of the program of research carried out at Harvard University using the PDP-1-based graphics facility, the PDP-10, and the ARPA Network. Projects undertaken include development of techniques for graphic input and display and development of graphics applications, development of a programming system intended as a tool for attacking 'difficult' programming projects and suitable for use concurrently at several nodes of the ARPA Network on a common computational task, development of programs specific to use on the ARPA Network and file transfer techniques, and research in automatic programming. The report references various published papers and technical reports which contain more detailed accounts of the work undertaken. (Author)

AD-775 150/6GA PC$3.75/MF$1.45
Electronic Systems Div L G Hanscom Field Mass
COMPUTER ACCESS UTILIZING MAGNETIC CARDS WITH MODIFIABLE CODES,
Arthur L. Masson, and Charles G. Cobb, III. Jan 74, 54p Rept no. ESD-TR-74-110

Descriptors: *Computer programming, *Data processing security, Data processing terminals, Coding, Identification, Reading machines, Magnetic recording systems, Logic circuits, Schematic diagrams.
Identifiers: Computer access, PDP-11/20 computers, MCS(Modifiable Credential System), Modifiable credential system, Computer security.

The report is a feasibility study of a technique using a one-time password on a magnetic card as a means of user identification for computer terminal access. A magnetic card reader/recorder was interfaced with a PDP-11/20 computer to provide a demonstration model. Interface logic diagrams and detailed description of the software used in the demonstration model are included. A method is shown for calculating the size of the major elements of the software required for implementation in any computer system. The report outlines some requirements of computer operation system in which identification feature is eventually used. (Author)

AD-775 164/7GA PC$4.50/MF$1.45
Honeywell Information Systems Inc Mclean Va
TRANSACTION PROCESSOR ENHANCEMENTS.
Final technical rept.,
B. Cassidy, H. Richmond, and J. Burke. Dec 73, 115p RADC-TR-73-369
Contract F30602-72-C-0491

Descriptors: *Computer programming, *Data management, Computer programs, Control sequences, Interfaces, Queueing theory, Input output devices.

The report includes the following items: (1) A study of the Transaction Processor (TPE) and its unique features for interfacing with DM-1 access services through an application program. (2) A consultation and study in conjunction with Auerbach Corporation for perfecting the best approach of interfacing the TPE-1 by either incorporating selected features of the Honeywell DMS into DM-1 or modifying the TPE to best take advantage of these features. (3) Computer program documentation, which includes program design techniques, program listings, control cards and run instructors for the interface program between the TPE and DM-1. (Author)

AD-775 220/7GA PC$4.00/MF$1.45
System Development Corp Santa Monica Calif
ARPA NETWORK IMPLEMENTATION UNDER ADEPT.
Technical memo.,
A. S. Landsberg. 3 Mar 72, 12p Rept no. SDC-TM-4891/000/00

Descriptors: *Computers, *Communications networks, *Computer programming, Access, Networks.
Identifiers: ARPA computer network, *Computer networks, ADEPT computerprogram.

The document describes how an ADEPT programmer can gain access to the ARPA computer network. It contains a general introduction to the network and describes process connection and communication over the network via ADEPT system calls. (Modified author abstract)

AD-775 232/2GA PC$3.75/MF$1.45
Bolt Beranek and Newman Inc Cambridge Mass
NATURAL COMMUNICATION WITH COMPUTERS IV.
Quarterly progress rept. no. 13, 1 Oct-31 Dec 73.
Jan 74, 74p Rept no. BBN-2721
Contract DAHC15-71-C-0088, ARPA Order-1697
See also AD-763 748.

Descriptors: *Computer programming, *Speech recognition, Speech compression, English language, Natural language, Signal processing, Semantics, Phonetics, Syntax, Communications networks.
Identifiers: LISP programming language, TENEX system, Computer networks, ARPA computer networks, Automatic programming.

The authors report the details of progress on Natural Communications with Computers IV in the areas of Speech understanding, distributed computation and TENEX improvements, language research, and speech compression.

AD-775 237/1GA PC$3.25/MF$1.45
Purdue Univ Lafayette Ind Dept of Chemistry
COMPUTERIZED PATTERN RECOGNITION APPLICATIONS TO CHEMICAL ANALYSIS. DEVELOPMENT OF INTERACTIVE FEATURE SELECTION METHODS FOR THE K-NEAREST NEIGHBOR TECHNIQUE.
Technical rept. no. 1, 1 Apr 73-21 Feb 74,
Marty A. Pichler, and Sam P. Perone. 21 Feb 74, 39p
Contract N00014-67-A-0226-0021

Descriptors: *Pattern recognition, *Chemical analysis, Interactive graphics, Classification, Statistical analysis.
Identifiers: Feature selection, Nearest neighbor rules.

A systematic approach has been developed for feature selection in the application of the K-nearest neighbor (KNN) computerized pattern recognition method. The approach uses an operator-interactive computer system. A large number of potentially-useful features for classification of patterns can be screened for the most relevant members by a combination of recommended procedures. These include: (a) one-dimensional KNN classification of all patterns using each feature individually; (b) inspection of histogram displays of classification records for each feature; and (c) establishment of consensus classifications from combined one-dimensional results. A computerized trial-and-error procedure can then be implemented to find the best combination of a minimum number of features for accurate classification using the multi-dimensional KNN method. (Modified author abstract)

AD-775 305/6GA PC$5.00/MF$1.45
System Development Corp Santa Monica Calif
SOFTWARE MILESTONE MEASUREMENT STUDY.
Technical document Mar-Jun 73,
N. E. Willmorth, and N. S. Mathis. 7 Nov 73, 172p
NELC-TD-285
Contract N00123-73-C-0481

Descriptors: *Computer program documentation, Requirements, Standards, Management planning and control, Quality assurance, Production control.

The study seeks to determine how software development progress and product quality may be measured and what impact variances from required product quality and established schedules and budgets have upon project success or failure. Accordingly, a list of candidate milestone products is produced, potential indicators of satisfactory or unsatisfactory progress and quality are identified, and the impact of variances on future project performance is predicted and the criticality of the indicators estimated. Finally, the ability of currenly specified software documentation standards to meet configuration control requirements is evaluated, as is the impact of granting waivers and exceptions to the specified standards. (Author)

AD-775 321/3GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
A VISIT WITH 'NAIRI',
A. Alekseev. 28 Dec 73, 8p Rept no. FTD-HT-23-704-74
Edited trans. of Sovetskii Voin (USSR) n20 p42-43 1972, by Edwin P. Pentecost.

Descriptors: *Computers, *USSR, Translations.
Identifiers: Nairi-3 computers.

Describes work going on at the Yerevan Scientific Research Computer Institute in developing the Nairi-3 computer.

AD-775 351/0GA PC$7.75/MF$1.45
Massachusetts Inst of Tech Cambridge Artificial Intelligence Lab
PATERSON'S WORM,
Michael Beeler. Jun 73, 95p Rept no. AI-M-290
Contract N00014-70-A-0362-0003

Descriptors: *Pattern recognition, Worms, Tracks, Graphics.
Identifiers: Paterson worm.

A description of a mathematical idealization of the feeding pattern of a kind of worm is given. Certain prehistoric worms fed on sediment in the mud at the bottom of ponds. For efficiency, they would not retrace paths which had already been traveled, since little food was left there. Yet food probably occurred in patches, so it was desirable to stay near previous trails. Worms had innate 'rules' regarding how close to 'eaten paths' to stay, how far to go before turning around, how sharp a turn to make, etc. These rules varied from species to species, and paleontologists can trace the development of species and determine the similarity of different species by comparing fossil records of worm tracks. Paths of worms are modelled through pattern recognition. (Modified author abstract)

AD-775 372/6GA PC$3.75/MF$1.45
Battelle Columbus Labs Ohio
APPLICATION OF INTERACTIVE GRAPHICS TO THE AVIONICS EVALUATION PROGRAM.
Technical rept. 15 Jan-29 Jun 73,
David W. Welp, Ronald A. Brown, Jerry L. Pittenger, and David A. Nippert. Nov 73, 63p
AFAL-TR-73-270
Contract F33615-72-C-2081

Descriptors: *Interactive graphics, *Computer applications, *Avionics, Computer graphics, Data processing equipment, Computer programming.
Identifiers: AEP computer program, PDP-11 computers.

A computer program for simulation and effectiveness evaluation of avionics for military aircraft has been developed and expanded for the purpose of providing the Avionics Laboratory with the capability of executing the Avionics Evaluation Program (AEP) via interactive graphics and to adapt the program for use on the Avionics Laboratory computer. The AEP is a very large computer program with extensive multidiscipline input data. There was a very clear need to provide an easier means of executing the program, storing potential input data, and graphically presenting results. During the contract extension Battelle's Columbus Laboratories have (1) procured interactive graphics equipment, (2) developed interactive software, (3) procured additional equipment for the Air Force Avionics Laboratory PDP 11 computer to support the interactive capability, and (4) made additional modifications to the AEP to enhance its capability and to make it compatible with the PDP 11 computer. This report presents a description of the resultant effort.

AD-775 380/9GA PC$5.50/MF$1.45
Proprietary Software Systems Inc Beverly Hills Calif
A STATISTICS GATHERING PACKAGE FOR THE JOVIAL LANGUAGE.
Final technical rept. Dec 72-Aug 73,
Joel E. Fleiss, and Guy W. Phillips. Jan 74, 196p
RADC-TR-73-381
Contract F30602-73-C-0062

Descriptors: *Programming languages, Compilers, Control sequences, Statistical analysis, Data processing, Mathematical logic, Instruction manuals.
Identifiers: *JOVIAL programming language, Design.

The objective of this project is to provide design guidelines for the creation of a measurement system for effectively evaluating the various features of the JOVIAL language. This tool, if properly designed and used, will aid JOVIAL language specialists in improving the efficiency of the language and its associated compilers. The language references in this final report is JOVIAL J73 as represented in the JOVIAL Programmer's Users Guide, January 31, 1973. (Modified author abstract)

AD-775 404/7GA PC$3.25/MF$1.45
Ohio State Univ Columbus Dept of Geodetic Science
A FORTRAN 4 PROGRAM FOR THE INVERSION OF A LARGE SYMMETRIC MATRIX BY BLOCK PARTITIONING,
Pentti Karki. Sep 73, 46p* Rept nos. DGS-205, Scientific-12 AFCRL-TR-73-0714
Contract F19628-72-C-0120

Descriptors: *Matrices(Mathematics), *Computer programs, Computations, Compilers, Subroutines, FORTRAN.
Identifiers: FORTRAN 4 programming language, IBM 370/165 computers, *Matrix inversion, Partitions(Mathematics).

A computer program to invert a large symmetric matrix is described in the report. The given upper triangular portion of a symmetric matrix is partitioned and inverse returned as a result. The minimum region required by the program is 252 K bytes which is still enough to invert a 10000 x 10000 symmetric matrix. If the matrix is not positive definite, a special bordering method (DBINV) is used to invert needed submatrices, otherwise a factorization method (DSINV) is used. The program requires two tape units, one for the input matrix, the other one for the resulting inverse. Four temporary direct access disk units are also needed. The program has been implemented on a IBM 370/165 computer with a maximum user available core of 630 K bytes, not all of which may be needed by the programs described in this report. (Author)

AD-775 451/8GA PC$4.50/MF$1.45
Illinois Univ Urbana Coordinated Science Lab
ON COMPUTATIONAL SECURITY,
Fred Alan Stahl. Jan 74, 102p* Rept nos. R-637, UILU-ENG-73-2241
Contract DAAB07-72-C-0259

Descriptors: *Computations, *Computer programming, *Cryptography, Coding, Security, Time sharing, Algorithms.
Identifiers: *Computer security, *Computational security, *Computational cryptography, Homophonic ciphers.

Computational security deals with the wide spectrum of protection for computational facilities and resources against unauthorized access and use, as well as from loss due to uncontrollable events. The paper investigates means by which cryptographic techniques can be used to secure sensitive data in computers. A survey of the relevant topics in computational security is presented. Two techniques that can be used to encode sensitive data in computer systems are developed. (Modified author abstract)

AD-775 452/6GA PC$3.75/MF$1.45
Stanford Univ Calif Dept of Computer Science
A CATALOG OF QUADRI/TRIVALENT GRAPHS,
N. S. Sridharan. Jan 74, 51p Rept no. STAN-CS-74-404
Contract DAHC15-73-C-0435, ARPA Order-2494
Sponsored in part by National Institutes of Health.

Descriptors: *Graphics, *Computer applications, Catalogs.
Identifiers: *Graph theory.

In a previous report a method for computer generation of quadri/trivalent vertex-graphs was presented in detail. The report is a catalog of 13 classes of graphs generated by using this method. (Author)

AD-775 461/7GA PC$3.75/MF$1.45
Illinois Univ Urbana Coordinated Science Lab
ON THE IMPLEMENTATION OF AN INFORMATION SYSTEM FOR SEMANTIC MODELING AND COMPUTER UNDERSTANDING,
Steven Jay Weissman. Dec 73, 54p Rept nos. R-635, UILU-ENG-73-2239
Contract DAAB07-72-C-0259

Descriptors: *Artificial intelligence, *Natural language, *Data processing, *Semantics, *Information systems, Memory devices, Theorems, Theses.
Identifiers: Question answer systems.

In order to program the computer to answer questions about problems which occur in real-world situations, it is necessary to have the computer 'understand' the relevant facts and relationships pertaining to the problem. The field of artificial intelligence is involved with developing the techniques which allow the computer to achieve this level of understanding. These procedures are used in order to solve problems which are beyond the scope of present computer applications. In the report some of the implementation techniques used in an artificial intelligence system are described. The system is designed to maintain a dialogue and answer questions dealing with the driver's world. This experimental data base has been chosen because it is dynamic in nature and is complex enough to allow more than trivial questions and deductions. Also, the problems encountered in this domain are of a general nature and are not restricted to the driver's world. The system has the capability to make intelligent assumptions by either filling in missing information and if multiple interpretations exist, by choosing the most probable interpretation. (Modified author abstract)

AD-775 546/5GA PC$7.25/MF$1.45
Massachusetts Inst of Tech Cambridge Project Mac
COMPUTER AND DATA SECURITY: A COMPREHENSIVE ANNOTATED BIBLIOGRAPHY.
Interim scientific rept.,
John Arthur Scherf. Jan 74, 308p* Rept no. MAC-TR-122
Contract N00014-70-A-0362-0006, ARPA Order-2095

Descriptors: *Computers, *Data processing, *Security, *Bibliographies, Computer programming, Information, Vulnerability, Time sharing.
Identifiers: *Computer information security, *Computer privacy, *Computer security, MAC project.

The report is an attempt to produce a bibliography covering all aspects of computer and data security, and having annotations that more than superficially describe each article's content. This bibliography contains 1,022 entries. About half of these entries are extensively annotated, another quarter being superficially annotated, and the rest being unannotated. All extensively annotated entries are rated as to their current usefulness and uniqueness. A subject index of 160 items is provided for referencing purposes. The introduction to this bibliography briefly discusses: privacy, security, and integrity; threats of data misuse; physical, procedural, and hardware/software security; development and scope of the bibliography; the subject index; outstanding articles and books; computer security firms; and the future. (Modified author abstract)

AD-775 569/7GA PC$8.25/MF$1.45
Wharton School of Finance and Commerce Philadelphia Pa
DESIGN CONSIDERATIONS FOR A DISTRIBUTED DATA ACCESS SYSTEM.
Technical rept.,
Richard W. Peebles. May 73, 401p*
Contract N00014-67-A-0216-0007

Descriptors: *Computer programming, *Time sharing, *Communications networks, Data processing, Computer programs, Scheduling, Network flows, Data management, Memory devices, Allocations.
Identifiers: *Computer networks, Design.

Recent years have witnessed the emergence of a new structure for computer systems--the distributed computer network. Several complete computers (CPU, primary storage, secondary storage and operating software) are linked via electronic communication lines to provide a single resource. That is users of one machine in the network (node) can access facilities at another node. Networks are motivated by desires to provide resource sharing (CPU-time, storage space, software, data,...), to improve reliability, and to take advantage of savings in communications costs. The chief focus of network research to date has been the communications subsystem. Existing telephone system facilities are inadequate because they cannot provide adequate bandwidth and reliability unless each node of the network has one or more direct broadband (say, 50 kilo bits/second). links to each other node. Progress has been made in the area of computer communications, but general software systems for networks have not been studied. The work considers the issues of designing a network software system. In particular, it is argued that the most urgent requirement is to develop a mechanism for data sharing. (Modified author abstract)

COM-74-10470/4GA PC$5.50/MF$1.45
National Bureau of Standards, Washington, D.C. Inst. for Computer Sciences and Technology.
USE OF COMPUTER NETWORKS IN SUPPORT OF INTERACTIVE GRAPHICS FOR COMPUTER-AIDED DESIGN AND ENGINEERING.
Interim rept. Jul 71-Jun 72,
Marshall D. Abrams, Jerome A. Hudson, Paul Meissner, Thomas N. Pyke, Jr., and Robert M. Rosenthal. 30 Jun 72, 48p NBSIR-73-217
Sponsored in part by Army Electronics Command, Fort Monmouth, N.J.

Descriptors: *Data processing terminals, *Graphic methods, Networks, Feasibility.
Identifiers: *Computer aided design, *Interactive computer graphics, *Computer networks, ARPA computer network, Interactive systems.

The report covers work performed between 1 July 1971 and 30 June 1972 as part of a long-term study of interactive computer-aided techniques. The primary emphasis during this period has been on investigating the feasibility of using computer networks in support of interactive graphics for computer-aided design and engineering. Alternative means for providing remote computer service have been studied. An experimental configuration has been devised taking advantage of the fact that there is located at the National Bureau of Standards a node of the ARPA Computer Network. Arrangements were made via this configuration for users at the Electronics Command to use a structural design program, NASTRAN, at a remote computer site. Emphasis has been placed on the evaluation of performance of interactive design techniques using displays supported by local and remote computers in a hierarchical arrangement. A variety of problems are identified which must be considered in order to support interactive graphics via a computer network; these are compounded where the network itself is in an evolving state of development. The report includes an outline of a synchronous communication protocol which was developed for use between ECOM and NBS.

COM-74-10475/3GA PC$3.25/MF$1.45
National Bureau of Standards, Washington, D.C. Inst. for Computer Sciences and Technology.
CHARACTERIZATION AND TESTING OF INTERACTIVE GRAPHICS FOR COMPUTER-AIDED DESIGN AND ENGINEERING.
Interim rept. Jul 72-Jun 73,
Siegfried Treu. 30 Jun 73, 37p* NBSIR-73-289
Sponsored in part by Army Electronics Command, Fort Monmouth, N.J.

Descriptors: *Data processing, *Graphic methods, Data processing terminals, Man machine systems.
Identifiers: *Computer aided design, *Interactive computer graphics, MEDEA system, Interactive systems.

The report presents material developed as part of a long-term Interactive Computer-Aided Techniques Study. The report outlines the stages of development in the use of interactive graphics as a tool for Computer-Aided Design and Engineering (CAD/E). A series of characteristics are presented which are of significance to the designers and users of such systems and a series of questions of evaluative interest posed. These questions are intended to delineate the extent to which a system under examination achieves its stated design objectives. The characteristics are grouped in accordance with the nature and complexity of the experiments which would need to be conducted to establish values for them. The report suggests selected characteristics of particular interest and suggests the design of experiments for examining them in detail. The report makes specific reference to the MEDEA design terminal concept under development within the Graphical Systems and Technology Branch of ECOM.

COM-74-50172/7GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Systems Development Div.
USER PROCEDURES STANDARDIZATION FOR NETWORK ACCESS.
Interim rept.,
A. J. Neumann. Oct 73, 43p NBS-TN-799
Paper copy available from GPO $0.70 as C13.46:799.

Descriptors: *Data processing terminals, *Programming manuals, Control sequences, Standardization.
Identifiers: Computer networks, Access.

User access procedures to information systems have become of crucial importance with the advent of computer networks, which have opened

new types of resources to a broad spectrum of users. This report surveys user access protocols of six representative systems. Functional access requirements are outlined, and implementation of access procedures is analyzed by means of a common methodology. Qualitative assessment of standardization possibilities identify standardization candidates such as: system and user signals, online user entries, system requests, and network wide categories of message content. (Author)

COM-74-50173/5GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Inst. for Computer Sciences and Technology.
NETWORK MANAGEMENT SURVEY.
Technical note,
Ira W. Cotton. Feb 74, 91p NBS-TN-805
Grant NSF-AG-350
Paper copy available from GPO $1.20 as C13.46:805.

Descriptors: *Computers, *Network analysis(Management), Networks, Management planning, Installation, Operations, Interfaces, Financing, Accounting, Regulations, Security.
Identifiers: *Computer networks, ARPA computer network, MERIT computer program, TUCC computer network, TYMNET computer network, Oregon State Regional computer network.

The report presents the results of a study of management practices in different computer networks. Five networks were chosen as typical of different approaches to network implementation and management: Defense Advanced Research Projects Agency (ARPA) Network, MERIT Network, Triangle Universities Computation Center (TUCC), Oregon State Regional Network and Tymnet, a commercial network. A common format is employed to survey each network. While the report is not intended to be prescriptive, some empirical observations are presented for each topic covered. (Author)

COM-74-50174/3GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Inst. for Computer Sciences and Technology.
GOVERNMENT LOOKS AT PRIVACY AND SECURITY IN COMPUTER SYSTEMS. A SUMMARY OF A CONFERENCE HELD AT THE NATIONAL BUREAU OF STANDARDS, GAITHESBURG, MARYLAND, 19-20 NOVEMBER 1973.
Final rept.,
Clark R. Renninger, and Dennis K. Branstad. Feb 74, 46p NBS-TN-809
Paper copy available from GPO $0.85 as C13.46:809.

Descriptors: *Computers, *Secure communication, *Meetings, Security, Protection, Government policies, Information systems.
Identifiers: *Computer privacy, *Computer information security.

The publication summarizes the proceedings of a conference held for the purpose of highlighting the needs and problems of Federal, State and local government in safeguarding individual privacy and protecting confidential data contained in computer systems from loss or misuse. The origin of governmental problems is discussed in the context of the public's concern for privacy arising out of computer-based recordkeeping, the diverse legislative actions how being taken to safeguard privacy, the threats to the security of computer-based information systems and the technological problems associated with protecting against such threats. Useful distinctions are drawn between privacy, confidentiality and security to clarify the issues and allocate responsibilities for solving the problem among lawmakers, technologists and management. Major needs are described. These include the need for cohesive Federal, State and local legislation, technological guidelines and standards for assuring uniform compliance with legislative requirements; management guidelines for identifying and evaluating threats to security; and improved technological mechanisms for controlling access to computer systems and networks. Cost implications of providing security measures are discussed. (Author)

COO-1469-224 PC$13.00/MF$1.45
Illinois Univ., Urbana (Usa). Dept. Of Computer Science.
QUARTERLY TECHNICAL PROGRESS REPORT, JANUARY--MARCH 1973.
1973, 217p COO-2118-45, UIUCDCS-QPR-73-1

Descriptors: (*Computers, *Research programs), Computer codes, Planning, Programming languages, Reviews.

For abstract, see NSA 29 05, number 12414.

COO-3288-27 PC$3.00/MF$1.45
Johns Hopkins Univ., Baltimore, MD. (Usa).
STUDIES IN THE ORGANIZATION OF COMPUTER SYSTEMS. PROGRESS REPORT NO. 27, OCTOBER 1, 1972--SEPTEMBER 30, 1973.
M. J. Flynn. 1973, 10p
Contract AT(11-1)-3288

Descriptors: (*Computers, *Research programs), Data processing, Electronic equipment, Planning, Programming.

For abstract, see NSA 29 05, number 12416.

HEDL-SA-563 PC$3.00/MF$1.45
Hanford Engineering Development Lab., Richland, Wash. (Usa).
IMPLEMENTATION EXPERIENCES OF NASTRAN ON CDC CYBER 74 SCOPE 3.4 OPERATING SYSTEM.
J. C. D. Go, and R. G. Hill. 1973, 5p CONF-730959-1

Descriptors: (*Cdc computers, *Operation), (*Computer codes, *N codes), Meetings, Univac computers.

For abstract, see NSA 29 05, number 12419.

JPRS-61131 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
UNIFIED COMPUTER SYSTEM OF THE SOCIALIST COUNTRIES.
Yu. A. Shmykov, and R. I. Gogunov. 4 Feb 74, 14p
Trans. of Pribory i Sistemy Upravleniya (USSR) n9 p4-7 1973.

Descriptors: *Computers, *Expositions, *USSR, Computer systems hardware, East Germany, Poland, Czechoslovakia, Bulgaria, Hungary, Translations.

The report contains a description of the international exhibition of the unified system of electronic computers of socialist countries held in Moscow in May 1973.

KAPL-M-7313 PC$4.50/MF$1.45
Knolls Atomic Power Lab., Schenectady, N.Y. (Usa).
DATATRAN 2 PRIMER.
H. J. Kopp. Aug 73, 46p
Contract W-31-109-eng-52

Descriptors: (*Programming languages, *Manuals), (*Data processing, Programming languages), Computer codes, Fortran.

For abstract, see NSA 29 05, number 12420.

KFK-1873 PC$5.75/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Labor fuer Elektronik und Messtechnik.
CAMAC SYSTEM CONTROLLER FOR PROCESS COMPUTER TYPE TELEFUNKEN TR86.
P. H. Gruber, and J. G. Ottes. Oct 73, 74p
In German. U.S. Sales Only.

Descriptors: (*Camac system, *Equipment interfaces), (*Computers, Equipment interfaces), Serpukhov synchrotron.

For abstract, see NSA 29 05, number 10294.

LA-5430-MS PC$4.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
NOVA BRANCH-DRIVER OPERATION.
L. R. Biswell, and D. T. Van Buren. Oct 73, 8p
Contract W-7405-eng-36

Descriptors: (*Computers, *Equipment interfaces), (*Camac system, Equipment interfaces), Control, Design, Operation, Programming, Signals, Specifications.

For abstract, see NSA 29 05, number 12422.

N74-14921/2GA PC$27.50/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
MISSION AND DATA OPERATIONS IBM 360 USER'S GUIDE.
J. Balakirsky. Jul 73, 509p NASA-TM-X-69900
Subm-Prepared in Cooperation with Computer Sciences Corp., Silver Spring, MD.

Descriptors: *Ibm 360 computer, *Information systems, *User manuals (Computer programs), Checkout, Computer programs, Data management.

For abstract, see STAR 1206

N74-14925/3GA PC$3.00/MF$1.45
Japan Broadcasting Corp., Tokyo.
IMAGES: INTERACTIVE MONTAGE AND ANIMATION GENERATING SYSTEM.
T. Omata, J. Kutsuzawa, H. Yasuda, and K. Kira. Aug 73, 10p NHK-LABS-NOTE-168

Descriptors: *Computer programs, *Ibm computers, *Motion pictures, Display devices, Photographic processing, Playbacks.

For abstract, see STAR 1206

N74-14928/7GA PC$3.25/MF$1.45
National Physical Lab., Teddington (England). Div. of Numerical Analysis and Computing.
ESTIMATING THE EXECUTION SPEED OF AN ALGOL PROGRAM.
B. A. Wichmann. Jun 73, 24p NPL-NAC-38

Descriptors: *Algol, *Algorithms, *Run time (Computers), Computer programs, Optimization, Weighting functions.

For abstract, see STAR 1206

N74-14929/5GA PC$3.75/MF$1.45
Consiglio Nazionale delle Ricerche, Rome (Italy). Lab. di Ricerca e Tecnologia per lo Studio del Plasma nello Spazio.
INPUT-OUTPUT ROUTINES IN BASIC LANGUAGE FOR THE HP2116B COMPUTER SISTEMA DI INGRESSO-USCITA IN LINGUAGGIO BASIC PER IL CALCOLATORE HP2116B.
F. Palutan. Feb 73, 35p LPS-73-6
Language in Italian.

Descriptors: *Basic (Programming language), *Hewlett-packard computers, *Input/output routines, Computer programming, Data acquisition, Flow charts.

For abstract, see STAR 1206

N74-14930/3GA PC$3.75/MF$1.45
Centre National de la Recherche Scientifique, Toulouse (France). Lab. d'Automatique et d'Analyse des Systemes.
TEKTRONIX 4010-1 VISUAL DISPLAY CONSOLE COUPLING TO THE CII 90-10 COMPUTER COUPLAGE D'UNE CONSOLE DE VISUALISATION TEKTRONIX 4010-1 AVEC LE CALCULATEUR CII 90-10.
M. Benoit, and D. Ribot. Oct 73, 33p LAAS-SIS-73-I-28
Language in French.

Descriptors: *Consoles, *Digital computers, *Display devices, *Real time operation, Cathode ray tubes, Computer programming, Hardware, Interfaces, Tables (Data).

For abstract, see STAR 1206

ORNL-4929 PC$5.45/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
OAK RIDGE COMPUTERIZED HIERARCHICAL INFORMATION SYSTEM (ORCHIS) STATUS REPORT, JULY 1973.
A. A. Brooks. Jan 74, 63p
Contract W-7405-eng-26

Descriptors: (*Information systems, *Ornl), Computers, Data processing, Environment, Information retrieval, Programming.

For abstract, see NSA 29 05, number 12402.

ORO-4061-10 PC$3.00/MF$1.45
Rice Univ., Houston, Tex. (Usa). Lab. For Computer Science and Engineering.
INTERCHANGE OF ESSENTIAL PROGRAMS BETWEEN DISSIMILAR COMPUTERS. FINAL REPORT.
E. A. Feustel. 27 Jun 73, 9p
Contract AT(40-1)-4061

Descriptors: (*Programming languages, *Research programs), (*Computers, Programming languages), Computer codes, Programming.

For abstract, see NSA 29 05, number 12423.

PATENT-3 783 250 Not available NTIS
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
ADAPTIVE VOTING COMPUTER SYSTEM.
Patent.
L. J. Koczela, and D. S. Wilgus. Patented 1 Jan 74, 34p NASA-CASE-MSC-13932-1,
Misc-Filed 25 Feb. 1972 Supersedes N72-21206 (10 - 12 p 1581). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Adaptive control, *Computer systems design, *Hybrid computers, Comparator circuits, Error correcting devices, Fail-safe systems, *Patents.

A computer system is reported that uses adaptive voting to tolerate failures and operates in a fail-operational, fail-safe manner. Each of four computers is individually connected to one of four external input/output (I/O) busses which interface with external subsystems. Each computer is connected to receive input data and commands from the other three computers and to furnish output data commands to the other three computers. An adaptive control apparatus including a voter-comparator-switch (VCS) is provided for each computer to receive signals from each of the computers and permits adaptive voting among the computers to permit the fail-operational, fail-safe operation.

PB-227 071/8GA PC$10.50/MF$1.45
Ohio State Univ., Columbus. Computer and Information Science Research Center.
AN ALGORITHM FOR GENERATING STRUCTURAL SURROGATES OF ENGLISH TEXT.
Technical rept.,
Suzanne Marvin Strong. Apr 73, 147p OSU-CISRC-TR-73-3
Grant NSF-GN-534-1

Descriptors: *Computer programming, *English language, *Syntax, *Grammars, Semantics, Graph theory, Information retrieval, Theses.
Identifiers: Natural language processors.

An algorithm is described for generating nonlinear representations of English text from syntactic and case grammar analysis. Application of the algorithm to samples of text have shown that automatic concept identification may be possible. Therefore these structural surrogates are recommended as a basis for automatic natural language processing.

PB-227 078/3GA PC$4.75/MF$1.45
Michigan Univ., Ann Arbor. Highway Safety Research Inst.
HIGHWAY SAFETY RESEARCH INSTITUTE (HSRI) SOFTWARE PACKAGE,
D. H. Robbins, and R. O. Bennett. 31 Dec 73, 130p* UM-HSRI-BI-73-8

Descriptors: *Computer systems programs, *Traffic safety, FORTRAN, Statistical analysis, Computation, Human factors engineering, Tires, Motor vehicle accidents.

Many computer programs have been developed at Highway Safety Research Institute since its formation. These cover subjects as diverse as the disciplines represented in the Institute. Among the major collections of programs are: (1) human kinematics and impact data analysis programs; (2) vehicle motion and tire simulations; (3) statistical research package; (4) accident data files and the associated software; and (5) vehicle lighting and vision programs. The report describes all software available at Highway Safety Research Institute.

PB-227 718/4GA PC$16.25/MF$1.45
Washington Univ., Seattle. Computer Science Group.
ON THE EFFICIENCY OF EXTENSIBLE LANGUAGES,
John Dudley Woolley. Jun 73, 263p TR-73-06-15 NSF-OCA-GJ66-EFFEXT
Grant NSF-GJ-66

Descriptors: *Programming languages, Syntax, Semantics, Mathematical logic, Computation, Efficiency, Design, Computer programs.
Identifiers: *Extensible programming languages, IBM 360 computers, IBM 370 computers.

A measurement system, called Menelaus, is described which aids in the design of an efficient, minimal extensible language. Results are discussed of using this system to: (1) determine an efficient core for James R. Bell's language Proteus; (2) study the effect of the structure of extensions on the efficiency of languages extended from this new core, Proteus 2. Specifically the effect of the depth of nesting of new modes and productions in the language, the forcing of semantics of transformations into syntax (where possible) and paring with large production sets is discussed. An assessment of the Proteus approach to extensible language design is given. IBM 360/370 implementations of Proteus 2 and Menelaus are discussed. (Author)

PB-228 474/3GA PC$8.25/MF$1.45
Illinois Univ., Urbana. Dept. of Computer Science.
OPTIMAL NETWORKS WITH NOR-OR GATES AND WIRED-OR LOGIC.
Master's thesis,
Tsuneo Kawasaki. Jan 74, 104p UIUCDCS-R-74-623
Grant NSF-GJ-40221

Descriptors: *Logic circuits, *Gates(Circuits), *Logic design, Networks, Computer programs, Mathematical programming, Optimization, Theses.
Identifiers: Integer programming.

Generally, Emitter Coupled Logic (ECL) gates have dual outputs (i.e., NOR-OR) and the outputs of two or more ECL gates can be tied together to realize OR functions without extra gates. This is called Wired-OR. Using gates with dual outputs and Wired-ORs, an algorithm to get the optimal networks, i.e., those which have a minimum number of NOR-OR gates and, as the secondary objective, a minimum number of connections, for a given arbitrary function, is discussed in the paper, under the assumption that only non-complimented variables are available as the network inputs. Only NOR-ORgates are used in these networks, but this algorithm can also be applied to networks with NAND-AND gates and Wired-ANDs. (Modified author abstract)

PB-228 629/2GA PC$3.75/MF$1.45
Arizona Univ., Tucson. Dept. of Computer Science.
A NEW APPROACH TO THE ANALYSIS AND SYNTHESIS OF STRINGS,
John N. Doyle. 19 Nov 73, 67p S4D38a NSF-OCA-GJ36272-S4D38A
Grant NSF-GJ-36272

Descriptors: *Programming languages, Patterns, Scanning, Partitions(Mathematics), Data processing.
Identifiers: *SNOBOL 4 programming language, String processing.

The paper presents a new approach to the analysis and synthesis of character strings. The facilities are based on the pattern-matching mechanism of SNOBOL4, but provide greater generality. The idea of a scanning directive is introduced. Directives control the scanning mechanisms, move a cursor that is positioned in a string, and generate results that contribute to a string value that results from scanning. (Author)

PB-228 786/3GA PC$3.00/MF$1.45
Iowa State Univ., Ames. Cyclone Computer Lab.
PROGRAM EXECUTION IN THE SYMBOL 2R COMPUTER.
Special technical rept.,
Perry Hutchison, and Karen Ethington. Oct 73, 10p ISU-CCL-7309 NSF-OCA-GJ33097-CL7309
Grant NSF-GJ-33097
Presented at the Symposium on the High-Level Language Computer Architecture Held at College Park, Md., Nov 73.

Descriptors: *Central processing units, *Data processing, Computer programming.
Identifiers: SYMBOL 2R computer, SYMBOL programming language.

The direct hardware implementation of the SYMBOL Programming Language (SPL) is highly dependent on an unusually powerful Central Processor (CP). This paper describes the principal features of the CP's operations in executing SPL programs.

PB-229 257/1GA PC$38.50/MF$1.45
California Univ., Los Angeles. School of Engineering and Applied Science.
ON THE DESIGN AND SPECIFICATION OF THE PROGRAMMING LANGUAGE OREGANO.
Technical rept.,
Daniel M. Berry. Jan 74, 706p UCLA-ENG-7388 NSF/OCA-GJ809-73883
Grant NSF-GJ-809

Descriptors: *Programming language, Design, Specifications, Syntax, Grammars, Semantics, Theses.
Identifiers: Oregano programming language.

In Part I the block-structured programming language, Oregano, with retention and facilities for multi-tasking and coroutining, is designed and described informally in terms of the Contour Model. An appendix to Part I gives a formal definition of Oregano using a K-grammar and the Vienna Definition Language; the definition is based on a formal definition of the Contour Model using the Vienna Definition Language. In Part II, a technique for proving the equivalence of implementations of multi-tasking programming languages is developed and applied to an informal proof of the equivalence of the contour model and a multi-tasking version of the copy rule (Part II is a previously published paper). (Author)

PB-229 352/0GA PC$8.25/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Project MAC.
MAKING COMPUTERS KEEP SECRETS.
Interim scientific rept.,
Leo J. Rotenberg. Feb 74, 395p* MAC-TR-115
NSF-OCA-GJ-34671-TR-115
Grant NSF-GJ-34671

Descriptors: *Data processing, *Information systems, *Security, Secure communication, Law(Jurisprudence), Computer programming, Decision making, Protection, Theses.
Identifiers: MAC project, *Computer information security, *Computer privacy, *Computer security, Data processing security.

The dissertation presents a unified design of protection mechanisms for a computer utility that (1) prevent accidental unauthorized releases of information, (2) prevent tyranny by dividing and limiting the power of the administrators of the utility, (3) preserve the independence of independent users of the utility, (4) accommodate to organizations having disparate traditional superior-subordinate relations, and (5) support proprietary services that allow users to build on the work of others in a context that protects the interests of lessors and lessees of services. The design includes specifications of both hardware and software protection mechanisms, including walls defined by domains and capabilities, and a hardware device, the Privacy Restriction Processor, that records the copying and combining of information in the computer by propagating privacy restrictions among restriction sets associated with segments and processes. (Modified author abstract)

RL-73-126 PC$3.25/MF$1.45
Science Research Council, Chilton (Uk). Rutherford High Energy Lab.
MNEMONIC: AN INTERACTIVE GRAPHICS PROGRAM TO GENERATE A TRIANGULAR MESH FOR TRIM.
M. J. Newman. Feb 72, 21p RHEL/R-238
U.S. Sales Only.

Descriptors: (*Poisson equation, Computer codes), (*Computer codes, *M codes), (*Interactive display devices, Computer codes), Analytical solution, Boundary conditions, Errors, T codes, Two-dimensional calculations.

For abstract, see NSA 29 05, number 12424.

SLA-73-859 PC$7.75/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
RESULTS OF CDC 6600 AND DEC PDP10 FORTRAN LIBRARY FUNCTIONS FOR INVALID ARGUMENTS.
C. B. Bailey, and T. H. Herrera. Dec 73, 112p
Contract AT(29-1)-789

Descriptors: (*Cdc computers, Fortran), (*Pdp computers, Fortran), (*Fortran, *Functions), Errors, Mathematics.

For abstract, see NSA 29 05, number 12425.

SLA-73-926 PC$4.50/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
INPUT PROCESSOR FOR TONOPAH TEST RANGE COMPUTER CENTER.
L. H. Minnear. Dec 73, 48p
Contract AT(29-1)-789

Descriptors: (*Missiles, *Monitoring), Computers, Data processing, Memory devices, Radar.

For abstract, see NSA 29 05, number 12426.

SLL-73-270 PC$5.50/MF$1.45
Sandia Labs., Livermore, Calif. (Usa).
OPERATION AND MAINTENANCE DOCUMENT FOR PROGRAM SHKSPEC.
E. D. Holbrook. Nov 73, 68p
Contract AT(29-1)-789

Descriptors: (*Impact shock, Computer codes), (*Computer codes, *S codes), Acceleration, Cdc computers, Data processing, Excitation, Fortran, Frequency dependence, Maintenance, Operation, Oscillations, Programming, Time dependence.

For abstract, see NSA 29 05, number 12429.

UCID-16381 PC$3.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
LLL COMPUTER GRAPHICS OUTPUT DEVICES.
D. Vickers. Nov 73, 18p
Contract W-7405-eng-48

Descriptors: Computers, Interactive display devices, Tables.

For abstract, see NSA 29 05, number 12430.

UCID-30076 PC$3.25/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
SIMULATION OF A MODEL OF A CDC 7600 COMPUTER.
G. G. Sutherland. 10 Oct 73, 23p
Contract W-7405-eng-48

Descriptors: (*Cdc computers, *Simulators), Performance, Programming.

For abstract, see NSA 29 05, number 12431.

WAPD-TM-1137 PC$3.00/MF$1.45
Bettis Atomic Power Lab., Pittsburgh, PA. (Usa).
BH99: A PROGRAM FOR THE STATISTICAL ANALYSIS OF DATA BASED ON THE EXTREME VALUE DISTRIBUTION.
T. Shimamoto. Aug 73, 19p
Contract AT(36-1)-GEN-14

Descriptors: (*Statistical models, Computer codes), (*Computer codes, *B codes), (*Data processing, Computer codes), Distribution, Functions.

For abstract, see NSA 29 05, number 12435.

9C. Electrical and Electronic Engineering

AD-774 881/7GA PC$3.00/MF$1.45
Office of Naval Research London (England)
NATO ADVANCED STUDY INSTITUTE: LARGE SCALE APPLICATION OF SUPERCONDUCTIVITY AND MAGNETISM,
Robert A. Hein. 26 Nov 73, 14p Rept no. ONRL-C-26-73

Descriptors: *Superconductivity, *Magnetization, *Symposia, Superconductors, Electromagnets, Machines, Transmission lines, Propulsion systems, Cryogenics, Great Britain.
Identifiers: Magnetic levitation.

The NATO Institute was held from 5 to 14 September 1973. Approximately 110 participants from 14 countries attended. Principal subject matter cover was: dc Machines and Propulsion; Transmission of Electrical Energy; High Field Magnet Research and Development; Practical Superconducting Materials; High Speed Magnetic Levitation and Propulsion; Present Large Scale Applications of Superconductors; ac Machines and Cryogenics. (Author)

AD-775 446/8GA PC$4.25/MF$1.45
Army Test and Evaluation Command Aberdeen Proving Ground Md
ELECTROMAGNETIC INTERFERENCE TESTS FOR ELECTRONIC EQUIPMENT.
Final rept. on test operations procedure.
1 Feb 74, 22p Rept no. TOP-6-2-542

Descriptors: *Electromagnetic interference, *Test methods, Electronic equipment, Electronics, Electromagnetic compatibility, Electromagnetic radiation, Vulnerability.

The report prescribes procedures and techniques for measuring frequencies and amplitudes of the electromagnetic interference characteristics (emission, compatibility, and susceptibility) of electronic and electromechanical equipment, systems and subsystems. It discusses selection of a testing chamber, sources of error due to chamber wall reflections, and techniques for error reduction. Definitions of terminology are provided. It is not applicable to vehicles and electrical subsystems or noncommunications electronic equipment. (Modified author abstract)

PATENT-3 463 981 Not available NTIS
Department of the Interior, Washington, D.C.
ON-OFF SERVO CONTROL FOR A FLUID LEVEL SENSOR INCLUDING A DIFFERENTIAL TRANSFORMER PICKOFF WITH LIMIT OVERRIDE.
Patent,
Harold O. Wires. Filed 25 Nov 66, patented 26 Aug 69, 8p PAT-APPL-597 149, DOCKET/SUR-911
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Servomechanisms, *Patents, Electric motors, Liquid level indicators, Detectors.
Identifiers: PAT-CL-318-18.

The patent describes a control system for bidirectional electric motors which are operable as a drive and overdrive for a follow-up mechanism having utility as part of a motored manometer for indicating and recording fluid level variations.

PB-228 885/0GA PC$4.25/MF$1.45
Cornell Univ., Ithaca, N.Y. Cornell Energy Project.
HIGH VOLTAGE DIRECT CURRENT TRANSMISSION,
Robert L. Shedden. Jan 71, 25p Paper-71-1 NSF-RA/N-71-001
Grant NSF-GI-29903
Report on National Energy Needs and Environmental Quality.

Descriptors: *Electric power transmission, Direct current, High voltage, Power transmission lines, Electric power distribution.

The report contains a brief summary of the technical status of high-voltage direct-current electric-power transmission in the United States and abroad. Since the first major d-c link from Stockholm to the island of Gotland began operation in 1954, at least six additional large-scale lines have been commissioned. In this country the 1500 Mw, 825-mile Pacific Intertie J is the only project that has been completed. Solid-state systems are under design and construction. A sampling of the extensive bibliography on this subject is included, as well as an appendix which summarizes per-

tinent details on a number of the major lines. (Author)

9D. Information Theory

AD-774 850/2GA PC$4.00/MF$1.45
TRW Systems Group Redondo Beach Calif
ERROR CORRECTING CODES FOR THE ENGLISH ALPHABET AND GENERALIZATIONS,
G. Solomon. 27 Jul 72, 15p Rept no. TRW-7130.34-148
Contract N00244-72-C-0720

Descriptors: *Error correction codes, *English language, *Alphabets, Algorithms.
Identifiers: Reed-Solomon codes, Error detection codes.

A powerful set of systematic error correction codes over the English alphabet is presented here for words up to length 27. The codes have minimum distance equal to the number of parity checks, and are generated by shift registers using ternary addition and multiplication. The English alphabet codes belong to a new class of systematic codes over any alphabet of size (p sup q)-1 where p is a prime. This includes the ten decimal numbers from 0 to 9 and the 36 alpha-numerics A - Z, 0 - 9. These codes are specific non-linear subsets of Reed-Solomon codes and inherit their error-detection and correction syndromes along with a non-linear condition. In general, there exist systematic codes of dimension k and length (p sup q) with minimum distance d = (p sup q)-k over any alphabet of size (p sup q)-j, provided that jd < (p sup q). (Author)

AD-775 030/0GA PC$8.00/MF$1.45
Naval Postgraduate School Monterey Calif
THE FEASIBILITY OF PULSE SIGNAL CLASSIFICATION BY SPECTRAL PARAMETERS.
Master's thesis,
John Donald Meloy. Dec 73, 98p

Descriptors: *Information theory, *Signal processing, Pulses, Shape, Classification, Walsh functions, Fourier transformation, Data processing, Computer graphics, Pattern recognition.
Identifiers: Fast Fourier transform, Fast Walsh transform, Fast Haar transform, Walsh transformation, Haar transformation.

The paper explores the feasibility of fast transform coefficients as classification features for pulse type signals. The fast transforms investigated are Fourier (FFT), Walsh (FWT), and Haar (FHT). A synthesized signal base containing 79 distinct pulse shapes of similar duration is analyzed for classification information compactness in the discrete time, Fourier, Walsh, and Haar bases. Nonparametric information measures are used. It is concluded that a Fourier basis representation enables the significant reduction of dimensionality necessary for further study as a generator of classification features. (Author)

AD-775 559/8GA PC$3.00/MF$1.45
Massachusetts Inst of Tech Cambridge Research Lab of Electronics
DIGITAL SIGNAL PROCESSING.
Semiannual technical rept. 15 Jul 73-15 Jan 74,
Alan V. Oppenheim. 26 Feb 74, 13p
Contract N00014-67-A-0204-0064, ARPA Order-1997
See also AD-738 673.

Descriptors: *Information theory, *Signal processing, Digital systems, Recursive filters, Speech recognition, Digital filters, Scientific research.
Identifiers: Recursive filters.

The following studies are discussed in the report: Development of a high speed digital processor for speech synthesis; design of two-dimensional recursive digital filters; reconstruction of multi-dimensional signals from their projections; signal analysis by cepstral prediction; speed transformations of speech; and the hardware implementation of a non-recursive digital filter. (Modified author abstract)

N74-14889/1GA PC$3.00/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Research Lab. of Electronics.
PROCESSING AND TRANSMISSION OF INFORMATION.
Quarterly Progress Report.
15 Jul 73, 11p NASA-CR-136619, QPR-110
Contract NGL-22-009-013

Descriptors: *Data processing, *Data transmission, *Mathematical logic, Hamiltonian functions, Hilbert space.

For abstract, see STAR 1206

PATENT-3 743 765 Not available NTIS
Department of the Air Force Washington D C
REDUNDANT AREA CODING SYSTEM.
Patent,
James J. Maier. Filed 26 May 71, patented 3 Jul 73, 5p Rept nos. PAT-APPL-147 094,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Coding, *Communication and radio systems, *Patents, Information theory.
Identifiers: PAT-CL-178-6-8.

The patent describes an apparatus for selecting areas of a film which are of no interest to a user, coding these unimportant areas for identification purposes and selecting the important areas to be translated into useable information. The important information and a code for the unimportant information is transmitted to a user facility, thereby decreasing the information transmitted to the user and conserving the bandwidth required for transmission.

9E. Subsystems

AD-774 796/7GA PC$3.00/MF$1.45
Army Electronics Command Fort Monmouth N J
FAILURE ANALYSIS OF AUTODIN MICROELECTRONICS.
Technical rept.,
E. B. Hakim, and R. Holevinski. Jan 74, 21p Rept no. ECOM-4187

Descriptors: *Integrated circuits, Microelectronics, Department of Defense, Telephone systems, Failure(Electronics), Reliability(Electronics), Failure.
Identifiers: AUTODIN(Automatic Digital Network), Automatic digital network.

A total of 401 integrated circuits (IC), both monolithic and hybrid, were investigated. These devices were obtained from AUTODIN systems, which were being repaired at the Tobyhanna Army Depot, Tobyhanna, Pa. Results are discussed.

AD-774 818/9GA PC$4.00/MF$1.45
Calspan Corp Buffalo N Y
MICROWAVE POWER GENERATION ANALYSIS.
Final technical rept. Jul-Dec 73,
Lawrence R. Burdette. Dec 73, 95p Rept no. CALSPAN-MK-5359-E-1
Contract DAAK02-73-C-0504

Descriptors: *Radiofrequency generators, Generators, Microwave equipment, Transportable, Klystrons, Microwave tubes, High power, Reviews, State of the art, Costs.

An analysis of existing and future capability in high-power CW microwave generation was performed. Existing high-power tubes include 500 kW klystrons in E-band and H-band, and a 400 kW Amplitron in E-band. Future tube development programs could produce tubes with 10 MW output in D-band (1 GHz) and with 1 MW output in I-band (10 GHz). Cost, size, weight, and probability of achieving rated output power data have been developed for presently feasible 1-MW generators, and for generators using developmental devices. A prototype 1-MW E-band generator could be developed within 2 years at a cost of approximately $1.3M, would occupy one 40 foot, fifth-wheel, trailer, would weigh 57,000 lbs, and would have a 0.85 probability of achieving 1-MW power output. (Author)

AD-774 821/3GA PC$3.00/MF$1.45
Collins Radio Co Cedar Rapids Iowa
HIGH STABILITY TEMPERATURE COMPENSATED CRYSTAL OSCILLATOR STUDY.
Interim rept. no. 1, 30 Apr-30 Oct 73,
Gayle E. Buroker. Feb 74, 23p ECOM-0137-1-73
Contract DAAB07-73-C-0137

Descriptors: *Crystal oscillators, Temperature control, Stability, High frequency.

The feasibility of a 5 pp 10 to the 8th power, high stability temperature compensated crystal oscillator (HSTCXO) was shown previously on USAEC contract no DAAB07-71-C-0136. The objective of this study is to maintain or improve the previous performance characteristics while reducing package size from 6.5 to 2.0 cubic inches. Studies pertinent to the practicality of volume production and use in tactical equipments are to be conducted, including thermally induced hysteresis, thermal transient behavior, frequency aging, and methods of reducing compensation cost. Study results to date indicate the size reduction is feasible mechanically. Certain degrees of thermal compromise are necessary as size shrinks, however, and the level of electrical/thermal performance will not be known until models are constructed and tested during the next period. Aging performance of a few HSTCXO models constructed on the previous contract appears to be less than 5pp 10 to the 10th power. (Author)

AD-774 883/3GA PC$8.00/MF$1.45
Martin Marietta Aerospace Denver Colo Denver Div
C-BAND CYLINDRICAL ARRAY.
Final rept. 17 Jul 73-31 Jan 74,
D. Bottoms, A. Hargis, E. Kirchhoff, and D. Lynes. Jan 74, 98p Rept no. MCR-74-1002
Contract N00014-74-C-0022

Descriptors: *Phased arrays, C band, Cylindrical bodies, Antenna arrays, Antenna radiation patterns, Power dividers, Antenna feeds.

The report details the design and fabrication of a C-band (6.4-8.9 GHz) cylindrical array with 360 degree azimuth coverage and an elevation beam squinted out of the azimuth plane. The array was designed using computer program calculations to determine such parameters as allowable element spacing, allowable squint angle (without grating lobes) and element positional tolerance. The element phase and amplitude excitation errors which were acceptable were also determined by the computer program. The array arrangement sleected was eight rows of eight elements staggered and stacked in a cylindrical configuration. The element type selected was a 'fat dipole' over a cup reflector which exhibited a 42% bandwidth. The feed network was a series of microcircuit power dividers arranged with one input and 64 outputs which exhibited an octave bandwidth. (Modified author abstract)

AD-774 911/2GA PC$4.00/MF$1.45
Hughes Research Labs Malibu Calif
INDUCTIVE ENERGY STORAGE SWITCHING TECHNOLOGY FOR HIGH REPETITION RATE LASERS.
Final rept. 1 May 72-30 Apr 73,
H. Alting-Mees. Aug 73, 98p*

Contract N60921-72-C-0306

Descriptors: *Electronic switches, *Energy storage, *Lasers, Electromagnetic induction, Switching, High power, High voltage, Plasmas(Physics), Liquid metals.
Identifiers: Liquid metal plasma valves.

The basic objective of this program was to determine the feasibility of a particular Hughes switching concept in a high repetition rate laser power conditioning system using inductive energy storage (IES). A second objective was to compare a conventional capacitive system and an inductive system (using the Hughes switching concept) in order to determine which system is the most appropriate for projected applications. The Hughes liquid-metal cathode plasma valve (LMPV) played a major role in this investigation because it is, at present, the only device capable of carrying high average currents with attendant recovery rates comparable to vacuum devices. The program was divided into three tasks. These tasks were: (1) Using the LMPV, evaluate experimentally different interruption methods; (2) through a scaling study provide a preliminary design of an 8.5-kA average, 10-kA peak, 100-kV LMPV; and (3) perform a systems study.

AD-774 937/7GA PC$3.00/MF$1.45
Electrac Inc Anaheim Calif
PHASE LOCK TRACK RECEIVER.
Technical rept.,
Raymond W. Honey, Sih Y. Cheng, and Warren L. Christianson. 15 Jan 74, 8p Rept no. TR-3
Contract N00014-73-C-0123

Descriptors: *Radio receivers, Phase locked systems, Electronics, Very high frequency, Frequency, Control, Frequency synthesizers.

All of the circuit cards were completed during the reporting period. All circuit cards were tested and installed. Subsystem tests revealed a number of problems, primarily concerned with the timing references used.

AD-775 015/1GA PC$6.00/MF$1.45
Naval Postgraduate School Monterey Calif
'THE HYPOLE' A VERTICALLY POLARIZED HYBRID DIPOLE FOR APPLICATION IN LAND MOBILE AND SHIPBOARD COMMUNICATIONS.
Master's thesis,
Herbert Bramwell Shaw, III. Dec 73, 58p

Descriptors: *Dipole antennas, Antennas, Ground vehicles, Antenna feeds, Ship antennas, Very high frequency, Polarization, Vertical orientation, Antenna radiation patterns, Electrical impedance, Theses.

A study was made of a unique feed system which was developed to improve the performance of typical half-wave vertical mobile communications antennas. Popular misconceptions concerning the absolute gain of such radiators are discussed. Since vehicular roof-sized ground planes limit the realizable gain of currently used half-wave whips, the goal selected was to decouple the radiator from these undersized ground planes. 'The Hypole' antenna which evolved is demonstrated to have adjustable input impedance which is easily matched, true half-wave dipole performance, and minimum gain and pattern degradation. (Author)

AD-775 024/3GA PC$6.25/MF$1.45
Naval Postgraduate School Monterey Calif
CORRELATION FUNCTIONS USING LAGUERRE TYPE CIRCUITS.
Master's thesis,
Jorge Pedro Auge. Dec 73, 62p

Descriptors: *Circuits, Correlation techniques, Electric filters, Signal processing, Signal to noise ratio, Functions(Mathematics), Computer programs, Theses.
Identifiers: Laguerre functions, *Correlation functions.

The work deals with the correlation functions and their methods of obtention. A method without a pure time delay is considered which uses Laguerre functions type filters. The possibilities of using the nonsymmetric Laguerre type filter are analyzed. A very inexpensive set of circuits which are useful to obtain the mentioned filters for low frequency signals are presented, together with their computer analysis and laboratory realizations. (Author)

AD-775 081/3GA PC$4.75/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
EXPERIMENTAL STUDIES OF A MULTIPLE MODE ARRAY TECHNIQUE FOR LIMITED SCAN APPLICATIONS.
Physical sciences research papers,
Robert J. Mailloux, and George R. Forbes. 6 Nov 73, 31p Rept nos. AFCRL-TR-73-0685, AFCRL-PSRP-575

Descriptors: *Phased arrays, Scanning, Antennas, Antenna arrays, Antenna radiation patterns, Electronic scanners, Multimode.

The report presents experimental data showing the limited scan capabilities of E-plane and H-plane horns and an eight-element array of E-plane horns. A theoretical discussion of scanning in two dimensions is included in the Appendix. (Author)

AD-775 082/1GA PC$4.00/MF$1.45
Air Force (15th) March AFB Calif
AN OVERLAPPED SUB-ARRAY FOR LIMITED SCAN APPLICATION.
Physical sciences research papers,
Robert J. Mailloux. 27 Sep 73, 20p Rept nos. AFCRL-73-0598, AFCRL-PSRP-566

Descriptors: *Phased arrays, Scanning, Antennas, Antenna arrays, Antenna radiation patterns, Electronic scanners.

The report describes a new technique for producing an overlapped sub-array pattern by higher order mode coupling between nearest neighbor phased array elements. Theoretical and experimental results are compared, and practical circuits described for one plane of scan. The Appendix presents a circuit for scanning in two planes. (Author)

AD-775 091/2GA PC$3.25/MF$1.45
California Inst of Tech Pasadena Antenna Lab
PULSED ANTENNAS.
Technical rept.,
Giorgio Franceschetti, and Charles H. Papas. Dec 73, 45p Rept no. TR-70 AFOSR-TR-74-0189
Grant AF-AFOSR-1935-70

Descriptors: *Antennas, Electromagnetic pulses, Transients, Response, Transient radiation effects, Mathematical analysis, Heuristic methods.

The problem of pulsed antennas has two complementary parts: (1) analysis of the radiation field when the driving voltage is given; (2) synthesis of the driven voltage when the radiation field is given. In the paper a number of heuristic procedures are presented, relating to the computation of transient radiation from elementary sources, coaxial apertures, infinitely long cylindrical antennas, and loop antennas. Comparison with available rigorous solutions and experiments is also provided. (Author)

AD-775 105/0GA PC$3.00/MF$1.45
Miteq Inc Hauppauge N Y
RF TRANSISTORIZED PREAMPLIFIER.
Final rept. Sep 72-Jul 73,
John Templeton. Jan 74, 18p RADC-TR-73-371
Contract F30602-73-C-0037

Descriptors: *Preamplifiers, Transistor amplifiers, Microwave amplifiers, Broadband, Radar, Linear systems.

The report covers the design, development, and testing of a matched pair of RF Transistorized Preamplifiers. The amplifiers operate over the 3.1 to 3.6 GHz frequency range and are intended for use with the Wideband Pulse Compression Radar located at the Floyd Test Facility. Of major significance are the 500 MHz bandwidth, improved operational stability, the ability to accept high level input signals, and parameter linearity sufficient to insure 40 dB side lobe suppression. (Modified author abstract)

AD-775 166/2GA PC$3.00/MF$1.45
Aerospace Corp El Segundo Calif Systems Engineering Operations
A SHALLOW RIDGED-CAVITY CROSSED-SLOT ANTENNA FOR THE 240- TO 400MHZ FREQUENCY RANGE.
Rept. for Sep 72-Mar 73,
H. E. King, and J. L. Wong. 31 Jul 73, 25p Rept no. TR-0074(4401)-1 SAMSO-TR-74-8
Contract F04701-73-C-0074

Descriptors: *Slot antennas, Ultrahigh frequency, Very high frequency, Cavities, Antenna radiation patterns, Feasibility studies.

An experimental study has been made of a shallow, ridged-cavity, crossed-slot antenna to determine its feasibility for operation in 240- to 400-MHz band. The various trends are summarized for the VSWR response characteristics as the cavity and slot parameters are varied. Based on the limited amount of data obtained from the experimental model, the VSWR <2.7:1 from 240 to 272 MHz and <2.1:1 from 290 to 400 MHz for a cavity with a maximum dimension of 33 x 33 x 4 in. Measured radiation patterns with the cavity mounted on a finite-size flat ground plane are shown. (Author)

AD-775 226/4GA PC$3.00/MF$1.45
Office of Naval Research London (England)
CONFERENCE ON 'HYBRID MICROELECTRONICS'.
Conference rept.,
P. H. Enslow, and Arthur H. Waynick. 27 Nov 73, 17p Rept no. ONRL-C-25-73

Descriptors: *Microelectronics, *Hybrid circuits, Microminiaturization, State of the art, Reviews, Technology, Thick films, Conferences, Great Britain.

A 'state of the art' survey of thick film and thin film hybrid circuits, combinations of descrete and deposited components, was the subject matter of the conference covered in the report. All facets of the technology are dealt with and specifically related to other forms of electronic assemblies. (Author)

AD-775 251/2GA PC$3.75/MF$1.45
Ohio State Univ Columbus Electroscience Lab
A NUMERICAL METHOD FOR ANTENNAS RECESSED IN A CAVITY OR A WAVEGUIDE WHICH OPENS INTO A HALF-SPACE.
Technical rept.,
E. H. Newman. Jan 74, 51p Rept no. ESL-3468-3
Contract N00014-67-A-0232-0018

Descriptors: *Antennas, Numerical analysis, Cavities, Waveguides, Electromagnetic radiation.

The problem considered is that of a perfectly conducting obstacle or probe in a waveguide or a cavity which opens into a half-space. A modal solution to the problem is described in terms of 'open waveguide modes.' The open waveguide modes are defined, a method for evaluating them presented, and finally they are used in the solution of the above mentioned problem. Numerical data is presented for the case of an air filled and a

dielectric loaded parallel plate cavity which opens into a half-space. While the current on the probe is assumed to be known for the numerical calculations, equations are given which could be solved for the probe current. Numerical difficulties were encountered in attempting to calculate the open waveguide modes for a rectangular waveguide. (Author)

AD-775 277/7GA Reprint
Maryland Univ College Park Dept of Electrical Engineering
TRANSISTOR-RESISTOR SYNTHESIS OF VOLTAGE TRANSFER FUNCTIONS,
Byron D. Berman, and Robert W. Newcomb. Sep 73, 5p AFOSR-TR-74-0202
Grant AF-AFOSR-1910-70
Revision of report dated 26 Oct 72.
Availability: Pub. in IEEE Transactions on Circuit Theory, vCT-20 n5 p591-593 Sep 73.

Descriptors: *Circuits, *Transfer functions, Synthesis, Transistors, Voltage, Resistors, Networks.

A synthesis of real-rational transfer functions is presented which uses only resistors and transistors as construction components. The method proceeds by incorporating transistor dynamics into a state-variable formulation and, as such, generalizes the ideas of Capparelli and Liberatore. (Author)

AD-775 327/0GA PC$3.75/MF$1.45
General Dynamics San Diego Calif Electronics Div
MICROWAVE HOLOGRAPHIC ANALYSIS OF CONFORMAL ARRAYS.
Final rept.,
R. A. Hayward, E. L. Rope, and G. Tricoles. Jan 74, 57p Rept no. R73-046-2
Contract N00019-73-C-0428

Descriptors: *Antenna arrays, *Arrays, *Holography, Microwaves, Diagnostic equipment, Near field, Resolution.
Identifiers: *Conformal arrays.

The report describes the continued development of a holographic method for analyzing the fields near a transmitting array, which may be planar or conformal. The method is also useful for correcting radomes. The method is based on holography, but it differs in the collection and processing of data. The method involves two steps. In the first, phase and intensity are measured on a spherical probing surface. In the second, nearfield distributions are numerically reconstructed from the complex conjugate of the measured data. Numerical reconstruction eliminates scaling limitations that occur when reconstructions are made with visible light. Because reconstructions are computed, the method is flexible. It applies to wide classes of curved arrays because the reconstructed field can be calculated at arbitrary locations. Diverse polarizations can be treated by repeating measurements with two probe orientations.

AD-775 363/5GA PC$4.75/MF$1.45
Corning Glass Works Raleigh N C Electronic Research Lab
ULTRA-STABLE MICROWAVE CAVITY.
Technical rept. (Final),
J. J. Pan, and J. Singletary. Oct 73, 141p Rept no. P-46-18-C RADC-TR-73-310
Contract F30602-71-C-0183

Descriptors: *Microwaves, *Microwave oscillators, Cavities, Sources, Impatt diodes, Stability, Tuning, Glass, Silicates, Titanium compounds.

The report covers the development of a stable fundamental microwave source designed for tuning between 4.4 to 5.0 GHz with a tuning accuracy of better than plus or minus kHz. The stability, tunability, and tuning accuracy are derived from a low expansion, tunable, titanium silicate glass TE sub 011 mode cavity. (Author)

AD-775 384/1GA PC$3.25/MF$1.45
Mcdonnell Douglas Astronautics Co Huntington Beach Calif
RADIATION TOLERANCE OF GAAS BROADBAND AMPLIFIER.
Final rept. 1 Apr-30 Sep 73,
Rainer Zuleeg, and Allen F. Behle. 31 Oct 73, 42p Rept no. MDC-G5033 AFCRL-TR-73-0666
Contract F19628-73-C-0245

Descriptors: *Microwave amplifiers, *Radiation effects, Gallium arsenides, Field effect transistors, Neutrons, Ionizing radiation, Reliability(Electronics), Gamma rays.

The response and degradation characteristics of microstripline GaAs junction field-effect transistor integrated microwave amplifiers were investigated in radiation environments. Permanent changes in electrical performance due to fluences of 5x 10 to the 14th power and 1x 10 to the 15th power neutrons/sq cm (E > 10 KeV) are reported and discussed. Experimental results are compared with theoretical predictions of device transconductance changes, which have been established and verified prior to this investigation. (Modified author abstract)

AD-775 397/3GA PC$8.00/MF$1.45
Control Data Corp Minneapolis Minn Aerospace Div
PLASMA DISPLAY/KEYBOARD (ADVANCED DEVELOPMENT MODEL).
Final rept. 1 Jul 72-1 Jul 73,
R. Kolodnyckij, R. D. Willey, C. Bergman, R. A. Strom, and H. T. Nielsen. Oct 73, 100p ECOM-0321-F-73
Contract DAAB07-72-C-0321

Descriptors: *Display systems, Screens(Displays), Keyboards, Modules(Electronics), Logic circuits, Schematic diagrams.
Identifiers: *Plasma display panels, Design.

The report discusses the electrical and the mechanical characteristics of the Advanced Development Model of the Display/Keyboard Model (Feasibility Type). In particular, it describes the plasma display panel, the keyboard, the logic, and the mechanical configurations and characteristics. (Author)

AD-775 438/5GA PC$4.75/MF$1.45
California Univ Livermore Lawrence Livermore Lab
COMPUTER EVALUATON OF LORAN-C ANTENNAS.
Final rept.,
Edmund K. Miller, and Fred J. Deadrick. 17 Oct 73, 131p Rept no. UCRL-51464
Contract W-7405-Eng-48

Descriptors: *Antennas, Mathematical models, Loran, Computer applications, Integral equations.
Identifiers: *Loran C.

Computer modeling techniques applied to a thin-wire electric field integral equation for the design and evaluation of several U. S. Guard Loran-C antennas are discussed and illustrated. Antenna input impedance and near electric fields are presented as functions of structure configuration, ground medium, ground screen, and layered ground parameter variations. (Author)

AD-775 526/0GA Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
AN ARRAY TECHNIQUE FOR REDUCING GROUND LOSSES IN THE HF RANGE,
Charles M. De Santis, Donn V. Campbell, and Felix Schwering. 7 Jun 73, 6p
Revision of report dated 9 Jan 73.
Availability: Pub. in IEEE Transactions on Antennas and Propagation vAP-21 n6 p769-773 Nov 73.

Descriptors: *Antenna arrays, High frequency, Losses, Ground(Electrical), Reduction.

Ground losses of HF antennas situated near the earth's surface are reduced if single antennas are replaced by small arrays of, for example, two or four closely spaced radiating elements. It is shown both theoretically and experimentally that an array spacing of approximately 0.1 wavelength is sufficient to achieve significant improvement in ground-to-ground transmission efficiency. In particular in the lower HF range and for poorly conducting ground, the improvement approaches a theoretical limit equal to the number of elements in the array. (Author)

AD-775 529/1GA Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
PERFORMANCE OF ELECTRON BEAM-SEMICONDUCTOR AMPLIFIERS,
George W. Taylor, Robert M. True, and Herbert M. Wagner. 8 Sep 72, 5p
Revision of report dated 17 Dec 71.
Availability: Pub. in IEEE Transactions on Electron Devices, vED-20 n4 p436-439 Apr 73.

Descriptors: *Microwave amplifiers, *Radiofrequency amplifiers, *Pulse amplifiers, *Semiconductor devices, Semiconductor diodes, Electron tube targets, Radiation effects.
Identifiers: Electron beam semiconductor devices.

Experimental results obtained with developmental electron beam-semiconductor devices used as video-pulse and RF pulsed amplifiers are discussed. These devices employ a grid-modulated electron beam to control the current in a semiconductor target. A problem of diode deterioration encountered with these developmental devices is discussed and solutions to the problem are presented. The reverse breakdown characteristic of both nonpassivated mesa diodes and silicon dioxide passivated planar diodes using 'p on n' material decreased by over 50 percent during the first few hours of operation. 'p on n' diodes with phosphorous glass over the silicon dioxide have been operated up to 59 h with little deterioration, and a planar diode with 'n on p' construction has been operated satisfactorily for 1000 h. (Modified author abstract)

AD-775 549/9GA PC$3.25/MF$1.45
RCA Labs Princeton N J
ALUMINUM-OXIDE PASSIVATION OF ELECTRON-BEAM-SEMICONDUCTOR SILICON AND GALLIUM-ARSENIDE DIODES.
Final rept. 1 Aug 72-30 Nov 73,
Wieslaw W. Siekanowicz, Ho. C. Huang, Dorothy Hoffman, Stewart Jolly, and Yuen C. Chiang. Feb 74, 32p Rept no. PRRL-74-CR-06
Contract N00014-73-C-0020

Descriptors: *Semiconductor diodes, *Microwave amplifiers, *Radiofrequency amplifiers, *Pulse amplifiers, Schottky barrier devices, Electron tube targets, Silicon, Gallium arsenides, Electron beams, Electron irradiation, Radiation effects, Life(Durability).
Identifiers: Electron beam semiconductor devices.

Beam-evaporated aluminum oxide constitutes a highly promising material for passivation of electron-beam-semiconductor targets. Aluminum-oxide-passivated targets are characterized by reverse breakdown voltages that range from 80% to essentially the full breakdown value and reverse leakage currents that are less than one microampere. A life of 2600 hours was demonstrated on an aluminum-oxide-passivated silicon pn-junction at a current gain of 2200, a beam voltage of 12 kV, and power and current densities of 42 W and 0.82 A/sq. mm, respectively. A life of 770 hours has been accumulated on a gallium-arsenide Schottky-barrier diode at a current gain of 2000, a beam voltage of 12.8 kV, power and current densities of 20 W and 0.48 A/sq. mm, respectively. The active diameter of each target was 0.012 inch. (Author)

AD-775 550/7GA Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
A WIDE-BAND ANTENNA-IMPEDANCE SIMULATOR,
Watson P. Czerwinski, and G. J. Seward. 2 Feb 73, 3p
Revision of report dated 2 Oct 72.
Availability: Pub. in IEEE Transactions on Antennas and Propagation, vAP-21 n4 p588-589 Jul 73.

Descriptors: *Antenna simulators, *Broadband antennas, Antennas, Electrical impedance, Monopole antennas, High frequency.

A relatively small cylindrical chamber is described which provides the capability to simulate the operational impedance characteristics of a whip antenna throughout the frequency range 30-76 MHz. This chamber, which does not contain tuning elements, is made of an aluminum cylinder with the inner surface lined with a highly absorbing ferrite tile. To adjust the impedance-controlling networks of a wide-band whip antenna, the top portion of the antenna whip is replaced by a metal disc and the assembly positioned axially within the chamber. The use of this chamber greatly simplifies tuning and power testing of the impedance-controlling networks of wide-band whip antennas. (Author)

N74-14898/2GA PC$3.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
CIRCULAR ENERGY VORTEX IN THE NEAR FIELD OF A DIRECTIONAL ANTENNA.
F. Landstorfer, H. Heinke, and G. Niedermair.
Jan 74, 16p NASA-TT-F-14754
Contract NASW-2483
Tran-Transl. Into English from Ntz-Nachrtech. Z. (Brunswick), V. 25, No. 12, Dec. 1972 p 537-541.

Descriptors: *Antenna radiation patterns, *Directional antennas, *Flux density, *Vortex rings, Dielectrics, Magnetic fields, Polarization characteristics.

For abstract, see STAR 1206

N74-14909/7GA PC$5.25/MF$1.45
Admiralty Surface Weapons Establishment, Portsmouth (England).
DEGRADATION OF COMMUNICATION ON AWF WHIP ANTENNAS IN AN ICING ENVIRONMENT AT SEA.
R. Kilgour, and W. K. Brown. Jan 73, 65p TR-73-4, BR36594

Descriptors: *Ice formation, *Radio communication, *Whip antennas, Electrical properties, Ice prevention, Impedance matching, Insulators, Low temperature environments, Radio transmitters, Sea water, Ships.

For abstract, see STAR 1206

PAT-APPL-433 968 PC$3.00/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
DIODE-QUAD BRIDGE CIRCUIT MEANS.
Patent Application.
D. R. Harrison, and J. Dimeff. Filed 16 Jan 74, 20p NASA-CASE-ARC-10364-2(B),
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Counting circuits, *Diodes, *Electric bridges, *Electronic transducers, Discriminators, Electrical measurement, *Patent applications, Proportional counters, Rc circuits.

A diode-quad bridge transducer circuit is reported that produces an output signal which is proportional to a relationship between at least two of the impedance elements. As a discriminator circuit it provides an output signal that is proportional to the input signal frequency.

PATENT-2 991 421 Not available NTIS
Department of the Interior, Washington, D.C.
FISH GUIDANCE DIRECT CURRENT SWITCHING DEVICES.
Patent,
Charles Daniel Volz. Filed 19 Nov 59, patented 4 Jul 61, 20p PAT-APPL-854 215, DOCKET/FWS-317
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Electric switches, *Patents, Direct current, Switching circuits, Interrupters, Fishways, Guidance.
Identifiers: PAT-CL-328-62.

The patent relates to direct current switching devices and more particularly to such a device adapted to be used in connection with a fish guidance system.

PATENT-3 518 448 Not available NTIS
Department of the Interior, Washington, D.C.
INTERMITTENT TIMER CIRCUIT.
Patent,
Leland W. Sprinkle. Filed 13 Feb 69, patented 30 Jun 70, 4p PAT-APPL-798 996, DOCKET/SUR-1284
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Timing circuits, *Patents, Intermittant operation.
Identifiers: PAT-CL-307-114.

The patent relates broadly to electrical timing circuitry, and more specifically to a timing circuit for activating an electrical operating circuit at intermittent programmed intervals.

PATENT-3 742 390 Not available NTIS
Department of the Air Force Washington D C
MULTI-FREQUENCY MICROSTRIP FILTER-DETECTOR.
Patent,
Martin R. Stiglitz, and James C. Sethares. Filed 23 Nov 71, patented 26 Jun 73, 5p Rept nos. PAT-APPL-201 348,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Detectors, *Patents, Microwave equipment, Strip transmission lines, Microwave filters.
Identifiers: PAT-CL-333-6.

The patent describes a filter-detector for selecting one or a number of narrow band microwave signals from either a wide band of microwave signals or from a source of spurious signals. It includes a microstrip circuit with coupling strips for coupling frequencies predetermined by resonators located on the circuit board and diodes at the output of each coupler branchline for detecting the signal.

PATENT-3 742 399 Not available NTIS
Department of the Air Force Washington D C
VERTICAL TAPELINE MICROWAVE COUPLER FOR PARAMAGNETIC SPIN RESONANCE.
Patent,
Owen Lewis. Filed 19 May 71, patented 26 Jun 73, 3p Rept nos. PAT-APPL-144 956,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Coupling circuits, *Patents, Microwave equipment, Energy, Radiofrequency, Paramagnetic materials, Broadband, Correlators.
Identifiers: PAT-CL-333-82-R.

The patent describes a device for coupling RF energy for use in magnetic spin resonance which includes a series of rectangular solids constructed of paramagnetic material. An electrically conducting folded ribbon is interleaved between the rectangular solid in the longitudinal direction. The ribbon and the rectangular solids are in surface contact with each other and the rectangular solids are in surface contact with upper and lower ground planes.

PATENT-3 743 955 Not available NTIS
Department of the Air Force Washington D C
RADIATION HARDENING READ PREAMPLIFIER.
Patent,
Robert A. Stehlin. Filed 13 Jul 71, patented 3 Jul 73, 4p Rept nos. PAT-APPL-162 071,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Preamplifiers, Patents, Radiation hardening, Gamma rays, Self operation, Semiconductor devices.
Identifiers: PAT-CL-330-22.

The patent describes a read pre-amplifier capable of operation in a radiation environment. It uses self compensation throughout to provide radiation hardness against the effects of photocurrents which are induced by gamma radiation.

PATENT-3 749 963 Not available NTIS
Department of the Air Force Washington D C
DEVICE TO AID IN CENTERING OF HIGH ENERGY ELECTRIC PARTICLE BEAMS IN AN EVACUATED DRIFT TUBE.
Patent,
Arthur R. Frederickson, Arnold D. Morris, and Walter B. Jackson. Filed 19 May 70, patented 31 Jul 73, 6p Rept nos. PAT-APPL-38 677,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Beam forming, *Patents, Electron beams, Electron accelerators, Control.
Identifiers: PAT-CL-315-18, Drift tubes.

The patent describes an apparatus for centering a high energy electron beam within an evacuated drift tube. An aluminum cylindrical target having mutually insulated quadrants is positioned within the tube to provide an indication of the beam position. An overload protection circuit is provided to automatically remove the target from the tube whenever an excess current condition exists.

PATENT-3 750 182 Not available NTIS
Department of the Air Force Washington D C
SUPPRESSED SIDELOBE EQUAL BEAMWIDTH MILLIMETER HORN ANTENNA.
Patent,
Nicholas P. Kernweis. Filed 8 Aug 72, patented 31 Jul 73, 4p Rept nos. PAT-APPL-278 852,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Horn antennas, *Patents, Millimeter waves, Sidelobes, Control, Dielectrics, Phase shifters, Beam forming.
Identifiers: PAT-CL-343-783.

The patent describes a millimeter horn antenna apparatus for providing millimeter wave frequencies with suppressed sidelobes and equal beamwidths in the orthogonal electric and magnetic planes.

PATENT-3 764 830 Not available NTIS
Department of the Air Force Washington D C
STRIPLINE VIDEO PULSE GENERATOR.
Patent,
William E. Blore, Srbislav Zivanovic, and Bernard Charest. Filed 27 Jun 72, patented 9 Oct 73, 4p Rept nos. PAT-APPL-266 816,

Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Pulse generators, *Patents, Strip transmission lines, Video signals, Short pulses, Radar equipment.
Identifiers: PAT-CL-307-260.

The patent relates to video pulse generators, and in particular to pulse generators of that type capable of producing subnanosecond video pulses for application in short pulse radar systems.

PATENT-3 783 399 Not available NTIS
National Aeronautics and Space Administration. Flight Research Center, Edwards, Calif.
FULL WAVE MODULATOR-DEMODULATOR AMPLIFIER APPARATUS.
Patent.
J. M. Black. Patented 1 Jan 74, 4p NASA-CASE-FRC-10072-1,
Misc-Filed 13 Jul. 1971 Supersedes N72-15206 (10 - 06, p 0742).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Amplifiers, *Demodulators, *Modulators, *Solid state devices, Field effect transistors, *Patents, Switching circuits.

A full-wave modulator-demodulator apparatus is described including an operational amplifier having a first input terminal coupled to a circuit input terminal, and a second input terminal alternately coupled to the circuit input terminal. A circuit is ground by a switching circuit responsive to a phase reference signal and the operational amplifier is alternately switched between a non-inverting mode and an inverting mode. The switching circuit includes three field-effect transistors operatively associated to provide the desired switching function in response to an alternating reference signal of the same frequency as an AC input signal applied to the circuit input terminal.

SLA-73-891 PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
HOT-GAS SOLDER LEVELING ON PRINTED CIRCUIT BOARDS.
T. A. Allen, and R. T. Sylvester. Dec 73, 26p
Contract AT(29-1)-789

Descriptors: (*Printed circuits, *Soldering), Fabrication, Gases.

For abstract, see NSA 29 05, number 12482.

SLA-73-990 PC$3.25/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
AUTOCORRELATION FUNCTION OF THE OUTPUT OF A HARD LIMITER WITH GAUSSIAN NOISE PLUS SINUSOIDAL INPUT.
E. A. Aronson. Nov 73, 24p
Contract AT(29-1)-789

Descriptors: (*Limiter circuits, *Electronic equipment), (*Signals, *Noise), (*Correlation functions, Limiter circuits), Electric filters, Gauss function, Mathematics, Numerical solution, Programming, Spectra.

For abstract, see NSA 29 05, number 12427.

9F. Telemetry

AD-775 248/5GA PC$5.75/MF$1.45
Raytheon Co Wayland Mass Equipment Development Labs
MULTIPLE TARGET STEERABLE TELEMETRY TRACER SYSTEM (MUSTRAC).
Final rept.
Jan 74, 212p
Contract N00019-71-C-0487

Descriptors: *Telemeter systems, Tracking, Telemetering data, Signal processing, Multiple operation, Telemetering antennas, Multiple beams(Radiation).
Identifiers: MUSTRAC(Multiple Target Steerable Telemetry Tracker Systems), Multiple target steerable telemetry tracker systems.

The report documents the successful design, fabrication and test of an Advanced Development Model of a Multiple Target Steerable Telemetry Tracker System (MUSTRAC). The MUSTRAC System has the capability of acquiring, tracking, and recording data from four independently maneuvering telemetry sources over a 50-degree solid angle. The report describes the MUSTRAC system which forms multiple simultaneous beams completely filling the required 50-degree solid angle and which, under control of a small computer, tracks four sources by a combination of switching and combining of these beams.

COM-74-10533/9GA PC$4.75/MF$1.45
Weather Bureau, Silver Spring, Md. Equipment Development Lab.
A WEATHER DATA RADIO TELEMETRY SYSTEM.
Technical memo.,
Robert R. Knibb, and Francis V. Kohl. Jan 69, 31p
WBTM-EDL-7 NOAA-74020723

Descriptors: *Radio telemetry, Meteorological data, Telemetering data, Airports, Very high frequencies, Frequency modulation.

The paper describes a system for telemetering weather sensor information by low-powered VHF-FM radio. It is particularly adapted for use at airports where end-of-runway sensors may be several miles from the observer's readout console, and where essentially line-of-sight radio paths exist. The system can accommodate analog voltage, pulse duration, and pulse count types of data signals. The engineering model described here serves as a telemeter for wind speed and direction, temperature, and dew point. Standard Weather Bureau sensors and readout panels are used, except for wind direction, for which modified standard instruments are used. (Author)

10. ENERGY CONVERSION (NON-PROPULSIVE)

10A. Conversion Techniques

PB-228 887/6GA PC$5.00/MF$1.45
Cornell Univ., Ithaca, N. Y. Cornell Energy Project.
COAL GASIFICATION: A REVIEW,
C. R. Aleta. Nov 71, 38p Paper-71-5 NSF-RA/N-71-015
Grant NSF-GI-29903
Report on National Energy Needs and Environmental Quality.

Descriptors: *Coal gasification, *Reviews, *Manufactured gas, Natural gas, In situ combustion.

Methods of underground and aboveground gasification of coal are reviewed. Four promising aboveground gasification techniques – Hygas CO2 Acceptor Process, Bigas, and Synthane – are described and compared. The objective of these four methods is to produce synthetic pipline gas from coal. Recent trends, however, indicate that production of natural gas from gasification of naptha feedstocks is likely to become commercialized earlier than production by gasification of coal. The environmental effects of fuel gasification of coal to supplement the deficiency of natural gas by the 1990's is discussed in the appendix. (Author)

UCID-16386(Pt.1) PC$3.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
ECONOMICS OF THERMODYNAMIC SOLAR POWER SYSTEMS. I. THE EFFICIENCY FUNCTION.
L. F. Wouters. 4 Sep 73, 12p
Contract W-7405-eng-48

Descriptors: (*Solar power plants, *Economics), Comparative evaluations, Design, Efficiency, Energy conversion, Solar energy.

For abstract, see NSA 29 05, number 12362.

UCID-16386(Pt.2) PC$3.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
ECONOMICS OF THERMODYNAMIC SOLAR POWER SYSTEMS. II. THE TURBINE TRADE-OFF.
L. F. Wouters. 19 Sep 73, 7p
Contract W-7405-eng-48

Descriptors: (*Solar power plants, *Economics), Design, Efficiency, Planning, Solar energy, Thermodynamic cycles, Turbines.

For abstract, see NSA 29 05, number 12363.

10B. Power Sources

AD-774 820/5GA PC$5.25/MF$1.45
Energy Research Corp Bethel Conn
HIGH VOLTAGE FUEL CELL ASSEMBLY.
Final rept. May 72-Jun 73,
Ralph N. Camp, and Bernard S. Baker. Jan 74, 44p
Rept no. ERC-1455F
Contract DAAK02-72-C-0458

Descriptors: *Fuel cells, Performance(Engineering), Electric batteries, Compatibility, Phosphoric acids.
Identifiers: *Hydrogen air fuel cells, Performance evaluation, Design.

The concept of a high voltage, planar fuel cell element was investigated. Experimental units composed of 2, 4 and 20 single, series connected cells were built and tested for periods of greater than 100 hrs. at temperatures of 130C. Phosphoric acid contained in organic fibre matrices was the electrolyte. A design based on the performance of these units is contained in the report. Twenty-cell units were able to produce 70mA/sq cm at 12 volts. (Author)

AD-774 832/0GA PC$3.25/MF$1.45
Energy Research Corp Bethel Conn
ELECTROLYTE FOR HYDROCARBON AIR FUEL CELLS.
Interim technical rept. no. 2, May-Nov 73,
Ralph N. Camp, and Bernard S. Baker. Feb 74, 29p Rept no. ERC-2597S
Contract DAAK02-73-C-0084
See also report dated Jul 73, AD-766 313.

Descriptors: *Fuel cells, *Electrodes, Sulfonic acids, Electrolytes, Halogenated hydrocarbons, Phosphoric acids, Fluorine compounds, Propane, Oxidation.
Identifiers: Ethane disulfonic acid/tetra fluoro, Butane disulfonic acid/octafluoro, Fuel cell electrolytes, Hydrocarbon air fuel cells.

The electrochemical properties tetrafluoroethanedisulfonic acid which had been shown to be superior to phosphoric acid as an electrolyte for direct propane oxidizing fuel cells were explored further. Platinum electrodes immersed in both tetrafluoroethanedisulfonic acid and phosphoric acid saturated with propane were subjected to linear cyclic voltage sweeps and the resultant currents plotted as a function of potential. Peaks corresponding to the absorbtion and oxidation of propane were found to lie at more reversible potentials in tetrafluoroethanedisulfonic acid. (Author)

AD-775 443/5GA PC$3.75/MF$1.45
Lockheed Missiles and Space Co Inc Sunnyvale Calif
CHILLED INVERTER MOTOR SYSTEM TEST.
Final rept.,
Lincoln B. Das, Richard R. Gilbert, and Louis J. Lawson. Oct 73, 59p Rept no. LMSC-D356644
Contract DAAK02-72-C-0594

Descriptors: *Refrigeration systems, *Inverters, *Electric motors, Liquid cooling, Drives, Electrical equipment, Electric propulsion, Vehicles, Solid state electronics, Power, Treatment.

The investigations described were concerned with the elevation of the 'CHILL SYSTEM' (a refrigerated liquid-cooling system for electric motors and solid-state power electronics.) The test arrangement and results obtained indicate that further study is desirable in order to fully evaluate the performance of such a Chilled Inverter Motor System. (Author)

BNWL-1801 PC$5.45/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
STUDY OF HANFORD CAPABILITY FOR SOLAR ENERGY RESEARCH AND DEVELOPMENT.
K. Drumheller. Nov 73, 55p
Contract AT(45-1)-1830

Descriptors: (*Solar energy, *Research programs), (*Hapo, Solar energy), Energy sources, Personnel, Production, Site selection.

For abstract, see NSA 29 05, number 12355.

CONF-720613-P1 PC$10.60/MF$1.45
Kernforschungsanlage Juelich G.M.B.H. (F.R. Germany).
THERMIONIC ELECTRICAL POWER GENERATION. VOL. 1. PROCEEDINGS OF THE 3RD INTERNATIONAL CONFERENCE, JUELICH, JUNE 5--9, 1972.
1972, 464p
In several languages. U.S. Sales Only.

Descriptors: (*Thermionic conversion, *Meetings), (*Thermionic reactors, Meetings), Leading abstract, Thermionic converters.

For abstract, see NSA 29 05, number 10002.

GA-8966 PC$4.00/MF$1.45
Gulf General Atomic CO., San Diego, Calif. (Usa).
NEUTRON RADIOGRAPHY OF IRRADIATED THERMIONIC CONVERTERS.
D. E. Schwarzer. 5 Nov 68, 38p
Contract AT(04-3)-167

Descriptors: (*Thermionic converters, *Neutron radiography), Autoradiography, Dysprosium, Foils, Indium, Iridium, Physical radiation effects.

For abstract, see NSA 29 05, number 10090.

GA-9526 PC$5.50/MF$1.45
Gulf General Atomic CO., San Diego, Calif. (Usa).
TEST OF A THERMIONIC CONVERTER WITH A GRAPHITE SORPTION CESIUM RESERVOIR.
G. O. Fitzpatrick, and M. K. Yates. Mar 70, 68p
Contract AT(04-3)-167

Descriptors: (*Thermionic converters, *Performance testing), Cesium, Efficiency, Graphite, Liquid metals, Thermionic diodes, Very high temperature.

For abstract, see NSA 29 05, number 10049.

KFK-1870 PC$7.00/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Neutronenphysik und Reaktortechnik.
INVESTIGATION OF CS-PLASMA DIODES BY IRRADIATION WITH LIGHT.
H. U. Karow. Sep 73, 99p
In German. U.S. Sales Only.

Descriptors: (*Thermionic converters, Thermionic diodes), (*Thermionic diodes, *Ionization), Cesium, Laser radiation, Optimization, Plasma density, Plasma diagnostics, Work functions.

For abstract, see NSA 29 05, number 10050.

N74-14785/1GA PC$9.75/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
IMPINGING JET SEPARATORS FOR LIQUID METAL MAGNETOHYDRODYNAMIC POWER CYCLES.
D. W. Bogdanoff. 1 Dec 73, 155p NASA-CR-136552, JPL-TM-33-621
Contract NAS7-100
Subm-Sponsored in Part by NAS-Nrc.

Descriptors: *Liquid-gas mixtures, *Magnetohydrodynamic generators, *Separators, Electric power plants, Jet impingement, Liquid metals, Separated flow, Two phase flow.

For abstract, see STAR 1206

N74-14786/9GA PC$9.50/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
DESIGN AND OPERATION OF A 1000 C LITHIUM-CESIUM TEST SYSTEM.
L. G. Hays, G. M. Haskins, D. E. Oconnor, and J. Torola, Jr.. 1 Dec 73, 149p NASA-CR-136555, JPL-TM-33-633
Contract NAS7-100

Descriptors: *Cesium, *High temperature tests, *Lithium, *Magnetohydrodynamic generators, Erosion, Fluid mechanics, Mass flow rate, Metallography, Separators, Thermodynamics.

For abstract, see STAR 1206

N74-14787/7GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
THE DRIFT FIELD MODEL APPLIED TO THE LITHIUM-CONTAINING SILICON SOLAR CELL.
M. P. Godlewski, C. R. Baraona, and H. W. Brandhorst, Jr.. 1973, 9p NASA-TM-X-71489, E-7825
Conf-Presented at 10TH Photovoltaic Specialists Conf., Palo Alto, Calif., 13-15 Nov. 1973; Sponsored by IEEE.

Descriptors: *Lithium, *Solar cells, Electric potential, Electron bombardment, Radiation effects.

For abstract, see STAR 1206

N74-14788/5GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
THE NASA-LEWIS TERRESTRIAL PHOTOVOLTAICS PROGRAM.
D. T. Bernatowicz. 1973, 8p NASA-TM-X-71491, E-7828
Conf-Presented at 10TH Photovoltaics Specialists Conf., Palo Alto, Calif., 13-15 Nov. 1973; Sponsored by IEEE.

Descriptors: *Power supplies, *Solar arrays, *Solar cells, *Weather stations, Cost effectiveness, Photovoltaic cells, Semiconductor devices, Silicon.

For abstract, see STAR 1206

N74-14789/3GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
LOW-HIGH JUNCTION THEORY APPLIED TO SOLAR CELLS.
M. P. Godlewski, C. R. Baraona, and H. W. Brandhorst, Jr.. 1973, 14p NASA-TM-X-71492, E-7829
Conf-Presented at 10TH Photovoltaic Specialists Conf., Palo Alto, Calif., 13-15 Nov. 1973; Sponsored by IEEE.

Descriptors: *Electric potential, *Semiconductor junctions, *Solar cells, Circuits, Electric contacts, Mathematical models.

For abstract, see STAR 1206

ORNL-EIS-73-65(Rev.1) PC$7.60/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
ENERGY RESEARCH AND DEVELOPMENT. A SELECTED READING LIST.
M. P. Guthrie, E. E. Huber, and G. A. Norwood. Nov 73, 99p

Descriptors: (*Energy, *Bibliographies), Electric power, Energy consumption, Energy reserves, Energy source conservation, Energy sources, Nuclear energy.

For abstract, see NSA 29 05, number 12361.

PATENT-3 336 161 Not available NTIS
Department of the Interior, Washington, D.C.
BIOCHEMICAL METHOD OF PRODUCING ELECTRICITY.
Patent,
Joseph A. Sutton, and John D. Corrick. Filed 11 Mar 63, patented 15 Aug 67, 4p PAT-APPL-264 743,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Primary cells, *Micoorganisms, *Patents, Ferrobacillus, Electrolytic cells.
Identifiers: PAT-CL-136-86, Ferrobacillus ferrooxidans.

This invention relates to the direct conversion of chemical energy to electrical energy by means of an electrolytic cell using microoganisms to oxidize iron compounds.

PATENT-3 551 209 Not available NTIS
Department of the Interior, Washington, D.C.
FORMATION OF SKELETAL METAL SOLID ELECTROLYTE FUEL CELL ELECTRODES.
Patent,
James J. Alles, Herbert E. Ricks, Wallace D. Reed, and Jay B. Carter. Filed 21 May 69, patented 29 Dec 70, 2p PAT-APPL-826 724, DOCKET/OCR-947
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Fuel cell electrodes, *Electrodeposition, Fuel cell electrolytes, Porous materials, Electroless plating.
Identifiers: PAT-CL-136-120.

This invention relates to solid electrolyte fuel cells having porous gas-diffusible metal electrodes such as skeletal nickel. A porous nickel, iron or cobalt electrode is coated on a solid ceramic electrolyte by (a) electrolessly depositing the metal on the electrolyte; (b) electrodepositing a second layer of the metal, while alloyed with molybdenum or tungsten, onto the electrolessly deposited layer; and (c) heating the electrodeposited layer in the presence of water vapor to drive off the molybdenum or tungsten as a volatile oxide.

PATENT-3 780 424
Not available NTIS
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
METHOD OF MAKING SILICON SOLAR CELL ARRAY.
Patent.
A. F. Forestieri, J. D. Broder, and D. T. Bernatowicz. Patented 25 Dec 73, 4p NASA-CASE-LEW-11069-1,
Misc-Filed 26 Oct. 1970 Supersedes N71-29048 (09 - 16, p 2541).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Solar arrays, *Solar cells, Flexible bodies, Mounting, *Patents, Silicon, Substrates.

A heat sealable transparent plastic film, such as a flourinated ethylene propylene copolymer, is used both as a cover material and as an adheaive for mounting a solar cell array to a flexible substrate.

PB-227 859/6GA PC$4.00/MF$1.45
Cornell Univ., Ithaca, N.Y. Cornell Energy Project.
RECENT STATE INITIATIVES ON POWER PLANT SITING: A REPORT AND COMMENT,
Judith A. Best. Feb 72, 15p Paper-72-3 NSF-RA/N-72-004
Grant NSF-GI-29903
Report on National Energy Needs and Environmental Quality.

Descriptors: *Electric power plants, Planning, Site surveys, Legislation.

Recent state efforts to solve the power plant siting problem indicate a trend toward formal preconstruction certification, consolidation of the certification process, mandatory consultation with or participation of the environmental protection agencies, thorough review of a wide range of environmental factors, public notice and opportunity for public hearings, and governmental review of long-range plans. The sudden outpouring of state legislation on power plant siting indicates an unmistakable change in the political climate. As this nation developed, it was assumed that industrial growth and development was desirable and the burden of persuasion fell to those who objected to show cause why the law should intervene. The most significant aspect of recent state legislation on power plant siting is a shift in priorities which often places the burden upon the industry and also on the state regulatory agencies to come forward with evidence justifying a proposed action and demonstrating it will not unduly disturb the natural environment. (Modified author abstract)

PB-228 632/6GA PC$4.00/MF$1.45
Illinois Inst. for Environmental Quality, Chicago.
POWER FACILITY SITING IN THE STATE OF ILLINOIS. PART I: SITING REGULATION ALTERNATIVES.
Final rept.,
Joseph G. Asbury, and B. M. Hoglund. Feb 74, 100p* IIEQ-74-4
Prepared in cooperation with Environmental Technology Assessment, Inc., Oak Brook, Ill.

Descriptors: *Electric power plants, *Utilities, Planning, Site surveys, Plant location, Decision making, Public utilities, Gas industry, Illinois.

The report summarizes the current administrative structure for power plant siting in Illinois, characterizes the actions taken by other states, and discusses several alternatives available to Illinois. The recommendations advanced by the authors would establish a systematic process for planning and siting energy conversion facilities and would expand the responsibilities of the Illinois Commerce Commission in certifying such facilities. The following recommendations were made: (1) that the Illinois Commerce Commission be designated as the state's final and exclusive siting authority; (2) that the utility companies submit annual long-range planning reports to the Illinois Commerce Commission, which will then evaluate these plans; (3) that the utilities file applications for site certification with the Illinois Commerce Commission at least two years in advance of planned construction, and that the applications contain environmental impact statements.

PB-228 684/7GA PC$5.75/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Energy Lab.
DYNAMICS OF ENERGY SYSTEMS.
Final rept. 15 Feb 72-14 Feb 73,
David C. White. 14 Feb 73, 51p NSF-RA/N-73-041
Grant NSF-GI-32874

Descriptors: *Energy, Operations research, Input output routines, Mathematical models, Electric power generation, Cost analysis.
Identifiers: Air pollution abatement, Water pollution abatement.

The RANN division of the National Science Foundation funded a one-year exploratory program on the 'Dynamics of Energy Systems'. The purpose of this program was to develop methodologies, analytical tools, and information processing techniques that can be used by planners, policy makers, and analysts in the energy field. This report summarizes the activities that were undertaken in this effort and identifies the major contributions. The applications of the models developed are discussed along with the areas in which expanded efforts are planned. A summary accounting of the effort expended is included.

PB-228 739/9GA PC$8.00/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Energy Lab.
THERMAL POLLUTION ABATEMENT EVALUATION MODEL FOR POWER PLANT SITING.
Final rept.,
P. F. Shiers, and D. H. Marks. Feb 73, 353p* MIT-EL-73-013 NSF-RA/N-73-043
Grant NSF-GI-32874

Descriptors: *Electric power plants, *Water pollution, Abatement, Planning, Site surveys, Computerized simulation, Economic costs, Environmental engineering, Wastes, Heat, Waste disposal.
Identifiers: *Thermal pollution, Waste heat disposal.

A thermal pollution abatement model for power plant siting is formulated to evaluate the economic costs, resource requirements, and physical characteristics of a particular thermal pollution abatement technology at a given site type for a plant alternative. The model also provides a screening capability to determine which sites are feasible alternatives for development by the calculation of the resource requirements and a check of the applicable thermal standards, and determining whether the plant alternative could be built on the available site in compliance with the thermal standards. The thermal pollution evaluation model analyzes the abatement technologies of surface discharge, diffuser, cooling pond, spray canal, and wet mechanical draft cooling towers. The typical site types evaluated are a river, small lake, great lake, coastal, estuary, offshore ocean, and water poor site. (Modified author abstract)

UCRL-51469 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
ANALYSIS OF THE WINDS OF SITE 300 AS A SOURCE OF POWER.
P. B. Archibald. 23 Oct 73, 17p
Contract W-7405-eng-48

Descriptors: (*Electric power, *Wind), California, Distribution, Economics, Regional analysis, Seasons.

For abstract, see NSA 29 05, number 12364.

10C. Energy Storage

AD-774 797/5GA PC$3.00/MF$1.45
Army Electronics Command Fort Monmouth N J
PERFORMANCE OF BATTERY BB-641/A IN OH-6A HELICOPTER.
Research and development technical rept.,
Sylvia Duze. Feb 74, 20p Rept no. ECOM-4190

Descriptors: *Nickel cadmium batteries, *Helicopters, Performance(Engineering), Aircraft equipment, Instrumentation, Monitors, Temperature, Voltage, Electric current, Tape recorders, Oscilloscopes.
Identifiers: Performance evaluation.

Instrumentation was devised at ECOM to simultaneously monitor the voltage, current, and temperature of a battery during start and flight of an aircraft. Data were collected continuously on a tape recorder so that any portion of the flight could be replayed in the laboratory. A portable oscilloscope was connected to the output terminals of the tape recorder to check its operation during flight of the aircraft. Battery BB-641/A, a 24 V, 13 Ah nickel-cadmium battery used in the OH-6A Helicopter, was selected for this investigation. After flight information was collected on the tape recorder, it was played back into a memory oscilloscope in the Laboratory and significant portions of the information were photographed. In addition, continuous written record of the data was obtained by replaying the tapes back on a recording voltmeter. This information can be used to determine the adequacy of the battery under its assigned conditions of location and performance in the aircraft, and various battery designs in the aircraft can be more positively evaluated. (Modified author abstract)

AD-774 811/4GA PC$5.00/MF$1.45
Eagle-Picher Industries Inc Colorado Springs Colo Precision Products Dept
NICKEL-CADMIUM MONOBLOCK BATTERY BB-433(X-1)/A.
Final rept. Apr 71-Feb 74,
James M. Hill, and Walter K. McCarter. Feb 74, 37p ECOM-0269-F-71
Contract DAAB07-71-C-0269

Descriptors: *Nickel cadmium batteries, *Aircraft equipment, Performance(Engineering).
Identifiers: Design.

Strong, high-temperature ceramics are defined as those materials that can withstand thermal cycling without failure which is necessary for their use in high temperature structural applications. Tor this reason, hot-pressed Si3N4 and SiC are emphasized. The relations between fabrication parameters, microstructure and strength are presented for both materials. Other structural considerations, viz., resistance to thermal shock and oxidation are reviewed. Finally, current directions for obtaining improved and new materials are discussed. (Author)

AD-775 428/3GA PC$3.25/MF$1.45
Eic Inc Newton Mass
LITHIUM - INORGANIC ELECTROLYTE BATTERIES.
Quarterly progress rept. no. 1, 17 Sep-15 Dec 73,
David R. Cogley, and Michael J. Turchan. Feb 74, 41p Rept no. C-401 ECOM-0030-1-74
Contract DAAB07-74-C-0030

Descriptors: *Storage batteries, *Lithium, *Chlorine, Performance(Engineering), Lithium compounds, Aluminum compounds, Chlorides, Sulfur compounds.
Identifiers: Lithium cells, *Lithium chlorine cells, High energy batteries, Lithium aluminum, Chlorides, Thionyl chloride.

The purpose of the present program is to study the feasibility of an all-inorganic electrolyte lithium primary battery operable and storable over the temperature range of -40F to +160F. The desired energy density is 150 watt-hours per pound of total battery weight and the desired power density is 50 watts per pound.

AD-775 527/5GA Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
LITHIUM INORGANIC ELECTROLYTE CELLS UTILIZING SOLVENT REDUCTION,
Wishvender K. Behl, John A. Christopulos, Maria Ramirez, and Sol Gilman. 15 Jun 73, 6p
Presented at the Meeting of the Society on Electrochemical Science and Technology, held in Boston, Mass., on 7-11 Oct 73. Revision of report dated 28 Mar 73.
Availability: Pub. in Jnl. of the Electrochemical Society, v120 n12 p1619-1623 Dec 73.

Descriptors: *Nonaqueous electrolytes, Solvents, Reduction, Energy, Density, Lithium compounds, Electrochemistry, Oxychlorides.
Identifiers: Lithium inorganic compounds, *Lithium cells, Thionyl chloride, Performance evaluation.

This paper describes a study of room temperature lithium cells employing solutions of LiBCl4 in POCl3 and LiAlC4 in SOCl2 as electrolytes and poly-tatrafluoroethylene (Teflon)-bonded carbon black electrodes as cathodes. A novel feature of these cells is that during discharge the solvents, i.e., POCl3 and SOCl2, are electrochemically reduced and behave as soluble cathodes. (Modified author abstract)

11. MATERIALS

11A. Adhesives and Seals

GA-9118 PC$5.50/MF$1.45
Gulf General Atomic CO., San Diego, Calif. (Usa).
HIGH-TEMPERATURE CERAMIC-TO-METAL SEAL DEVELOPMENT.
J. Chin, and C. W. Messick. 10 Feb 69, 66p
Contract AT(04-3)-167

Descriptors: (*Thermionic converters, *Seals), (*Niobium, *Brazing), (*Aluminium oxides, Brazing), Cesium, Niobium alloys, Vanadium alloys, Very high temperature.

For abstract, see NSA 29 05, number 10578.

PAT-APPL-304 585 PC$3.00/MF$1.45
Department of the Air Force Washington D C
MODIFIED POLYBENZOTHIAZOLE-BASED ADHESIVE.
Patent Application,
T. J. Apony. Filed 7 Nov 72, 16p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Adhesives, Patents, Performance(Engineering), Heat resistant materials, Polymers, Laminates, Thiazoles, Synthesis(Chemistry), Metals, Bonding.
Identifiers: *Patent applications, PAT-CL-260-4F, Benzothiazoles, *Polybenzothiazoles.

The patent application relates to an adhesive composition based upon a modified polybenzothiazole. A polybenzothiazole is modified by reaction with 4-aminophthalimide, aluminum and zinc oxide. The adhesive is particularly useful in bonding structural members, e.g., those fabricated from stainless steel or titanium, that are subjected to high temperatures as in the operation of high performance aircraft.

PATENT-3 681 268 Not available NTIS
Department of Agriculture, Washington, D.C.
MASTIC ADHESIVE COMPOSITION CONTAINING ZINC SALT OF FORMALDEHYDE-MODIFIED ROSIN.
Patent,
Albert R. Bunk, Bailey Bennett, David A. Berry, Noah J. Halbrook, and Walter H. Schuller. Filed 27 Feb 70, patented 1 Aug 72, 5p PAT-APPL-15 235,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Mastics, *Patents, *Styrene butadiene resins, Construction materials, Formulations, Zinc organic compounds, Formaldehyde.
Identifiers: PAT-CL-260-002-300.

This invention relates to a mastic adhesive composition containing a zinc salt of formaldehyde-modified rosin and a rubber selected from the group consisting of reclaim, natural, and styrene-butadiene rubbers.

PATENT-3 782 737 Not available NTIS
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SPIRAL GROOVE SEAL.
Patent.
L. P. Ludwig, and T. N. Strom. Patented 1 Jan 74, 6p NASA-CASE-XLE-10326-4,
Misc-Filed 24 Jan. 1972 Supersedes N72-27522 (10-18, p 2439). Subm-Continutation-in-Part of US Patent Appl. Sn-54540, Filed 13 Jul. 1970, Which Is a Continuation-in-Part of Abandoned US Patent Appl. Sn-723465, Filed 23 Apr. 1968.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Grooves, *Rotating shafts, *Seals (Stoppers), *Patents, Pump seals, Spirals (Concentrators).

Mating flat surfaces inhibit leakage of a fluid around a stationary shaft. A spiral groove produces a pumping action toward the fluid when the shaft rotates. This prevents leakage while a generated hydraulic lifting force separates the mating surfaces to minimize wear. Provision is made for placing these spiral grooves in communication with the fluid to accelerate the generation of the hydraulic lifting force.

11B. Ceramics, Refractories, and Glasses

AD-774 781/9GA Reprint
Army Materials and Mechanics Research Center Watertown Mass
KINETICS OF NITRIDATION OF SI POWDER COMPACTS,
Donald R. Messier, and Philip Wong. 2 Feb 73, 10p Rept no. AMMRC-TR-74-1
Presented at Annual Meeting of American Ceramic Society (75th), Washington, D.C., 9 May 72.
Availability: Pub. in Jnl. of the American Ceramic Society, v56 n9 p480-485 Sep 73.

Descriptors: *Silicon nitrides, *Ceramic materials, Silicon, Nitration, Reaction kinetics, Impurities, Particle size, Microstructure.

The kinetics of the reaction of Si powder compacts and N2 to form Si3N4 were investigated thermogravimetrically from 1300 to 1450C. The results indicate that trace amounts of O2 inhibit the rate of nitridation by forming a thin protective layer of SiO2, whereas Fe impurities catalytically accelerate the rate of reaction by liquid-phase formation. Complicating factors that account for difficulties in interpreting the reaction kinetics and for the poor agreement among previous investigations are discussed. (Author)

AD-774 879/1GA PC$3.25/MF$1.45
Honeywell Inc Minneapolis Minn Government and Aeronautical Products Div
DEVELOPMENT OF HIGH DRIVE, STABLE PIEZOELECTRIC CERAMIC.
Final rept.,
J. C. Kyonka. Jun 73, 45p
Contract N00024-72-C-1173

Descriptors: *Electroacoustic transducers, *Ceramic materials, *Piezoelectric materials, Lead compounds, Titanates, Zirconates, Doping, Ferrates, Antimonates, Manganese, Chromium, Strontium.
Identifiers: Lead titanates, Lead zirconates.

Lead zirconate titanate compositions with zirconia to titania ratios of 51/49 to 57/43 were studied. Lead substitutions with barium, cadmium and strontium were made plus doping with LaFeO3, NaSbO3, MnO2, Fe2O3, U2O8 and Cr2O3. Materials were prepared by hot pressing and atmosphere sintering and tested for aging, high field drive and axial stress sensitivity characteristics. Results of a pilot production run of standard ring specimens fabricated from the composition (Pb(.94)Sr(.06))(.980)(Zr(.51)Ti(.49))(.995) Cr(.015)Mn(.005)O3 are presented. (Author)

AD-774 930/2GA PC$3.25/MF$1.45
Pennsylvania State Univ University Park Materials Research Lab
THREE-DIMENSIONAL CHARACTERIZATION OF PARTICLES IN ALUMINA POWDERS BY AUTOMATED SEM (SCANNING ELECTRON MICROSCOPY) ANALYSIS,
Technical rept.,
L. Tarhay, W. R. Buessem, and E. W. White. 28 Feb 74, 26p Rept no. TR-2
Contract N00014-67-A-0385-0019
Presented at the American Ceramic Society Pacific Coast Regional Meeting (26th), 30 Oct-2 Nov 73, San Francisco, Calif.

Descriptors: *Alumina, *Particles, Electron microscopy, Electronic scanners, Geometry, Germanium, Tabulation processes.
Identifiers: Computer aided analysis.

The paper reports on the recently developed methods for complete morphological particulate characterizations including measurements of particle mass and thickness together with the usual microscope parameters of projected area and shape. The method is based on computer evaluation of scanning electron microscope images which renders the analysis particle by particle. Nine commercially available aluminas have been characterized by this method. Statistical characteristics are compared with special emphasis on a 'tabularity index', which results from a mathematical evaluation of the correlation between the directly measured particle mass and the particle volume computed from the microscopic equivalent circular diameter. (Author)

AD-774 934/4GA PC$3.00/MF$1.45
Solar San Diego Calif
STATIC FATIGUE OF CERAMIC MATERIALS.
Rept. for 1 Apr 73-31 Jan 74,
Mary E. Gulden, and Arthur G. Metcalfe. Feb 74, 21p Rept no. RDR-1778-1
Contract N00014-73-C-0401

Descriptors: *Ceramic materials, *Fatigue(Mechanics), Creep strength, Alumina, Silicon nitrides, Moisture, Strain(Mechanics).

Time-dependent failure in the temperature range zero to 900C of four ceramic materials is being studied by four-point bend testing at different strain rates. The standard environment for testing is water-saturated air at room temperature. The materials are sapphire, Wesgo Al 995 alumina, Norton NC-132 hot-pressed silicon nitride, and Norton NC-350 reaction-sintered silicon nitride. The purpose of the investigation is to identify the temperature range where static fatigue phenomena are important and subsequently to identify the moisture related stress corrosion processes which occur. Variable strain rate tests at different hu-

midities indicated this time-dependent failure was moisture related. (Modified author abstract)

AD-775 001/1GA PC$4.00/MF$1.45
Martin Marietta Labs Baltimore Md
GLASS FRACTURE CHEMISTRY.
Final rept. Apr 70-Dec 73,
Albert R. C. Westwood, William M. Mularie, and Norman H. MacMillan. Dec 73, 87p Rept no. MML-TR-74-08C
Contract N00014-70-C-0330

Descriptors: *Magnesium oxides, *Glass, *Fracture(Mechanics), Alkali glass, Hardness, Friction, Crack propagation, Surface properties, Diffusion, Activation energy.
Identifiers: Zeta potential.

The report summarizes results of research carried out under the Contract. Topics discussed include (1) the provision of evidence for a direct correlation between environment-sensitive surface potential and the mobility of near-surface dislocations in MgO, (2) chemomechanical control of sliding friction behavior in MgO and soda lime glass, (3) the role of environment-dependent surface potential in determining the propagation behavior of subcritical cracks in soda lime glass. Technical reports and publications resulting from this contract also are listed. (Modified author abstract)

AD-775 085/4GA Reprint
Ford Motor Co Dearborn Mich
REACTION-BONDED SILICON NITRIDE AS A SMALL GAS-TURBINE NOZZLE MATERIAL,
R. Nathan Katz, and Arthur F. McLean. Dec 73, 23p AMMRC-MS-73-7
Contract DAAG46-71-C-0162, ARPA Order-1849
Availability: Pub. in Proceedings of the British Ceramic Society, p409-427 1973.

Descriptors: *Silicon nitrides, *Gas turbine nozzles, Heat resistant materials, Brittleness.
Identifiers: Design.

Ceramic materials offer the only possibility to greatly increase turbine entry temperatures without using blade cooling. This paper discusses the development of a reaction-bonded silicon nitride nozzle (stator) for a small gas-turbine engine. Particular emphasis is given to the design, testing and failure analysis portion of the process, and how the results are then used to elucidate key problems for materials processing research and development. (Modified author abstract)

AD-775 200/9GA PC$3.25/MF$1.45
Ministry of Defence London (England) Director of Research Materials 2 (Air Systems)
EVALUATION OF HIGH TEMPERATURE-RESISTANT COATINGS FOR THE PROTECTION OF MAGNESIUM ALLOYS,
K. G. Adamson, J. F. King, and W. Unsworth. Jul 73, 36p Rept no. D Mat-196 DRIC-BR-38312

Descriptors: *Coatings, *Magnesium alloys, Heat resistant materials, Corrosion, Silicones, Polyimide resins, Organic coatings, Ceramic materials, Great Britain.

A number of commercially available high temperature resistant coatings have been evaluated by subjecting them to temperatures up to 350C for periods up to 1,000 hours, followed by exposure to corrosion tests. Only two paints, showed any degree of temperature resistance at 350C. The thermal stability of the polyimide coatings was good, but they failed due to their lack of adhesion to the chrome manganese film after exposures longer than 100 hours at 300C. (Modified author abstract)

AD-775 218/1GA PC$7.00/MF$1.45
Westinghouse Research Labs Pittsburgh Pa
STRONG, HIGH-TEMPERATURE CERAMICS.
Technical rept.,
F. F. Lange. 6 Feb 74, 78p Rept nos. 73-9D4-KERAM-P1, TR-11
Contract N00014-68-C-0323

Descriptors: *Ceramic materials, *Heat resistant materials, Silicon nitrides, Silicon carbides, Fabrication, Thermal properties, Impact strength, Creep, Fracture(Mechanics), Shock(Mechanics).

Strong, high-temperature ceramics are defined as those materials that can withstand thermal cycling without failure which is necessary for their use in high temperature structural applications. For this reason, hot-pressed Si3N4 and SiC are emphasized. The relations between fabrication parameters, microstructure and strength are presented for both materials. Other structural considerations, viz., resistance to thermal shock, impact and oxidation are reviewed. Finally, current directions for obtaining improved and new materials are discussed. (Author)

COM-74-50152/9GA Not available NTIS
National Bureau of Standards, Washington, D.C.
CRACK PROPAGATION IN CERAMIC MATERIALS UNDER CYCLIC LOADING CONDITIONS.
Final rept.,
A. G. Evans, and E. R. Fuller. 1974, 7p
Contract F33615-73-M-6501
Pub. in Metallurgical Transactions, v5 p27-33 Jan 74.

Descriptors: *Ceramics, *Crack propagation, Cyclic loads.

An analysis is presented which enable crack propagation rates under cyclic loading conditions to be predicted from static slow crack growth parameters. A comparison of the predicted times to failure under cyclic conditions with available measured failure times, for several ceramic materials at ambient temperatures, suggests that there is no significant enhancement of the slow crack growth rate due to cycling. This is verified in a series of measurements of slow crack growth rates under static and cyclic conditions.

HEDL-SA-578 PC$3.50/MF$1.45
Hanford Engineering Development Lab., Richland, Wash. (Usa).
BORON CARBIDE THERMAL CONDUCTIVITY.
D. E. Mahagin, J. L. Bates, and D. E. Baker. May 73, 29p CONF-731041-5
Contract AT(45-1)-2170

Descriptors: (*Boron carbides, *Physical radiation effects), Control elements, Fast neutrons, High temperature, Medium temperature, Neutron beams, Phonons, Point defects, Porosity, Scattering, Temperature dependence, Thermal conductivity, Very high temperature.

For abstract, see NSA 29 05, number 10595.

HEDL-TME-73-78 PC$5.45/MF$1.45
Hanford Engineering Development Lab., Richland, Wash. (Usa).
BORON CARBIDE THERMAL CONDUCTIVITY.
D. E. Mahagin, J. L. Bates, and D. E. Baker. Sep 73, 64p
Contract AT(45-1)-2170

Descriptors: (*Boron carbides, *Physical radiation effects), Burnup, Capture, Crystal lattices, High temperature, Hot pressing, Medium temperature, Neutron beams, Phonons, Pile neutrons, Porosity, Scattering, Temperature dependence, Thermal conductivity, Thermal diffusivity, Very high temperature.

For abstract, see NSA 29 05, number 10597.

KFK-EXT-6/73-3 PC$4.00/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany).
STRUCTURE, PREPARATION, AND PROPERTIES OF REFRACTORY COMPOUNDS AND SYSTEMS.
3 Aug 73, 40p
In German. U.S. Sales Only.

Descriptors: (*Transition element compounds, *Microstructure), (*Carbides, Microstructure), (*Nitrides, Microstructure), (*Carbonitrides, Microstructure), Physical properties, Refractories, Research programs.

For abstract, see NSA 29 05, number 10600.

PATENT-3 054 685 Not available NTIS
Department of the Interior, Washington, D.C.
FLUORMICA-FLUORAMPHIBOLE CERAMICS AND PROCESSES OF MAKING SAME.
Patent,
Haskiel R. Shell. Filed 9 Feb 60, patented 18 Sep 62, 3p PAT-APPL-7 732, DOCKET/MIN-300A
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Mica, *Fluorine compounds, *Amphiboles, Ceramics.
Identifiers: PAT-CL-106-39.

The products of this invention are useful in applications where increased strength and abrasion resistance are necessary, as in radomes, ceramic brake blocks, grinding wheels, and other uses of a similar nature. The invention provides a combination of matter comprising fluoramphibole and fluormica having superior properties, and a method for the preparation of the fluoramphibole-fluormica composition.

PATENT-3 782 181 Not available NTIS
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
DUAL MEASUREMENT ABLATION SENSOR.
Patent.
C. A. Gurtler. Patented 1 Jan 74, 5p NASA-CASE-LAR-10105-1,
Misc-Filed 11 Aug. 1971 Supersedes N72-11830 (10 -02, p 0262).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Ablative materials, *Surface properties, *Thermal resistance, *Thermocouple pyrometers, Charring, Electrical properties, Electronic equipment, Equipment specifications, *Patents, Thermal absorption.

A dual measurement ablation sensor for measuring both char-interface and surface recession at a point in an ablating material is described. The sensor permits measurement of the thickness of the char layer. Char-interface recession is indicated by a drop in the resistance to a current passed through the ablation material. Surface recession is indicated by the closing of an electrical circuit when melting causes the release of a spring switch.

11C. Coating, Colorants, and Finishes

AD-774 893/2GA PC$3.00/MF$1.45
Syracuse Univ N Y Dept of Chemical Engineering and Metallurgy
REFRACTORY INTERMETALLIC COMPOUND COATINGS.
Final rept. Jan 72-Jan 74,
P. J. Ficalora, V. Srikrishnan, and L. Pecora. Jan 74, 20p
Contract N00017-72-C-4424

Descriptors: *Coatings, *Hafnium compounds, *Zirconium compounds, *Platinum compounds,

Intermetallic compounds, Crystal structure, Thermodynamics.

The paper discusses the crystal structure, electronic configuration and thermodynamics of HfPt3 and ZrPt3. On the basis of this research the authors conclude films of HfPt3 and ZrPt3 can be used as coatings for components subjected to high temperature oxidizing atmospheres.

AD-775 122/5GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
THE USE OF ORGANOSILICON COMPOUNDS AS TRANSPARENT THIN FILMS,
N. V. Suikovskaya. 17 Jan 74, 9p Rept no. FTD-HT-23-942-74
Edited trans. of Trudy II Soveshchaniya po Khimii i Prakticheskomu Primeneniyu Kremniiorganicheskikh Soedinenii, Leningrad, Dec 69. Kremniiorganicheskikh Soedinenii, Leningrad, Dec 69. Kremniiorganicheskie Materialy, n.p., 1971 p268-270, by Louise E. Heenan.

Descriptors: *Silicones, *Organic coatings, Thin films, Translations, USSR.

AD-775 136/5GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
STUDY OF THE TEMPERATURE CONDITIONS FOR THE FORMATION OF AND THE SERVICE LIFE OF NI-CR-SI-B COATINGS,
E. A. Antonova, A. A. Appen, and P. S. Andrushchenko. 1 Feb 74, 15p Rept no. FTD-HT-23-611-74
Edited trans. of Fizika i Khimiya Obrabotki Materialov (USSR) n5 p31-37 1972, by Rene E. Courville.

Descriptors: *Coatings, *Nickel alloys, *Chromium alloys, *Boron alloys, *Silicon alloys, Steel, Translations, USSR.

Optimal temperature limits and other conditions are determined for the formation of metal-like coatings of the type Ni-Cr-Si-B on steels by dross technology from the technical powders of the initial elements. Microroentgen spectral analysis is used to determine the distribution of elements Fe, Ni, Cr, Si and B throughout the thickness of the coating and in the boundary layer as a function of firing conditions and the duration of subsequent temperature holding.

AD-775 197/7GA PC$3.25/MF$1.45
Ministry of Defence London (England) Director of Research Materials 2 (Air Systems)
EVALUATION OF THE DOW 17 TREATMENT FOR MAGNESIUM ALLOYS,
K. G. Adamson, J. F. King, and W. Unsworth. Feb 73, 44p Rept no. D Mat-192 DRIC-BR-38304

Descriptors: *Magnesium alloys, *Surface finishing, *Coatings, Ammonium compounds, Fluorides, Sodium compounds, Chromates, Phosphoric acids, Corrosion inhibition, Fatigue(Mechanics), Great Britain.
Identifiers: Ammonium fluorides, Sodium chromates.

The purpose of this investigation was to study the Dow 17 process and evaluate the coating in comparison with equivalent currently used pretreatments. The following main areas were investigated: Investigation of operating parameters of the Dow 17 bath; comparison of Dow 17 treatments with the DTD 911C required pretreatment; Comparison of various currently used protective systems based on Dow 17 with DTD 911C procedure; comparison of fatigue properties after Dow 17 treatments.

AD-775 198/5GA PC$3.25/MF$1.45
Ministry of Defence London (England) Director of Research Materials 2 (Air Systems)
IMPREGNATION OF ANODIC FILMS FOR THE PROTECTION OF MAGNESIUM ALLOYS,
J. F. King, K. G. Adamson, and W. Unsworth. Feb 73, 36p Rept no. D Mat-193 DRIC-BR-38303

Descriptors: *Magnesium alloys, *Coatings, Organic coatings, Epoxy resins, Surface treatment, Impregnation, Corrosion inhibition, Great Britain.

The resin impregnation of Dow 17 and H.A.E. anodic films on magnesium alloys has been investigated. A number of solvent free and solvent containing resins have been evaluated using dip and vacuum impregnation techniques. It was possible to effectively impregnate anodic films with a number of resins using a simple dip technique, but epoxy resins, particularly Araldite 985E gave the best corrosion protection. It is believed that a cost saving could be obtained by substituting a simple anodising-impregnating process for the rather lengthy and expensive surface sealing procedure of DTD 911C, although the impregnated anodic film may not be universally applicable. In close tolerance areas where very thin resin coats may be applied according to DTD 911C, coatings less than 0.001 ins. thick would not be possible with impregnated anodic films. This would necessitate masking during anodising, with consequently less cost saving. (Modified author abstract)

N74-15212/5GA PC$4.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
FORMULATION PROCEDURES, RATIONALE, AND PRELIMINARY IMP-H FLIGHT DATA FOR SILICONE PAINTS WITH IMPROVED STABILITY.
J. B. Schutt, and C. M. Shai. Dec 73, 39p NASA-TM-X-70560, X-764-73-373

Descriptors: *Paints, *Silicones, *Thermal protection, Explorer 47 satellite, Flight tests, Solar wind, Ultraviolet radiation.

For abstract, see STAR 1206

PATENT-3 744 295 Not available NTIS
Department of the Air Force Washington D C
PHOTOCHROMIC-THERMOCHROMIC COATING COMPOSITION.
Patent,
Sidney Allinikov. Filed 24 Nov 71, patented 10 Jul 73, 6p Rept nos. PAT-APPL-201 975,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Coatings, *Photochromic materials, *Patents, Microstructure, Metals, Thermal properties, Nondestructive testing, Aircraft, Laminates, Defects(Materials).
Identifiers: PAT-CL-73-15-R.

In the patent a photochromic-thermochromic coating composition is provided that comprises a resin base paint, a dye and an enzyme. The coating composition is sensitive to light and heat, thereby rendering it particularly useful in the non-destructive testing of structures to determine the presence of possible flaws. An object of the invention is provided a method for the non-destructive testing of laminated structures for aircraft.

PATENT-3 761 303 Not available NTIS
Department of the Air Force Washington D C
METHOD FOR IMPREGNATING MICROCRACKS IN CHROMIUM PLATING.
Patent,
Clinton Cox, John Pechonick, Jr., and Peter Zylstra, Jr. Filed 7 Dec 71, patented 25 Sep 73, 3p Rept nos. PAT-APPL-205 491,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Chromium, *Coatings, *Sealants, *Patents, Epoxy resins, Cracks, Impregnation, Heat treatment.
Identifiers: PAT-CL-117-71-M.

The patent describes a method for impregnating the microcrack surface pattern of chromium plated metal elements. It includes heating the element quenching the heated element in an epoxy resin maintained at room temperature to effect impregnation thereof and then curing the epoxy resin by heating the impregnated element.

11D. Composite Materials

AD-774 816/3GA PC$3.00/MF$1.45
Army Materials and Mechanics Research Center Watertown Mass
FRACTURE CHARACTERISTICS OF BORON FIBER-REINFORCED ALUMINUM 2024 AS DETECTED BY ACOUSTIC EMISSION.
Final technical rept.,
Albert F. Grenis, and Francis J. Rudy. Dec 73, 14p Rept no. AMMRC-TR-73-57

Descriptors: *Fiber reinforced composites, Boron, Aluminum alloys, Fibers, Composite materials, Fiber reinforcement, Matrix materials, Metals, Fracture(Mechanics), Acoustic emissions, Acoustic waves, Nondestructive testing.
Identifiers: Aluminum alloy 2024, Boron reinforced composites, Aluminum matrix composites.

Results of experimental studies using acoustic emission techniques with aluminum 2024 and with boron fiber-reinforced aluminum 2024 are discussed. Since the stress-strain relationship for the composite before fracture was also recorded, it was possible to detect that region (strain) where significant fiber fracture began for a particular composite specimen. Emphasis was on the study of the characteristics of fiber fracture rather than on determining the ultimate strength of the composite. (Author)

AD-774 890/8GA PC$4.50/MF$1.45
Tennessee Univ Space Inst Tullahoma
THE MECHANICAL PROPERTIES OF METAL MATRIX COMPOSITES SUBJECTED TO CYCLIC TEMPERATURE CHANGES.
Annual rept. 1 Jul 72-30 Jun 73,
Maurice A. Wright. Aug 73, 105p
Contract N00014-71-C-0121-0003

Descriptors: *Fiber reinforced composites, Aluminum alloys, Stainless steel, Composite materials, Matrix materials, Metals, Cycles, Fatigue, Thermal fatigue, Mechanical properties, Wire, Failure(Mechanics), Boron, Silicon carbides.
Identifiers: Steel reinforced composites, Aluminum matrix composites.

The mechanical properties of 6061 aluminum reinforced with fibers of stainless steel, 34 v/o SiC, 27 v/o boron and 45 v/o boron cross-plied 0/90 degrees, were determined in the as-received condition and after thermal fatigue. The properties investigated included longitudinal and transverse strength and modulus, major and minor Poisson's ratio, the density and the fracture toughness. It was concluded that the nature of the damage produced by exposing these materials to cyclic temperature variations consisted of voids and cracks that were solely connected with the matrix or matrix-fiber bond.

AD-774 964/1GA PC$3.00/MF$1.45
Monsanto Research Corp St Louis Mo
THE EFFECT OF STRESS ON DIFFUSION IN COMPOSITES - EXPERIMENTAL OBSERVATIONS,
D. C. Ruhmann, and E. M. Wu. 1 Feb 74, 21p Rept no. HPC-73-162
Contract N00014-67-C-0218, ARPA Order-876
Report on Monsanto/Washington Univ., ONR/ARPA Association project development of High Performance Composites.

Descriptors: *Fiber reinforced composites, Fiberglass, Composite materials, Glass reinforced plastics, Epoxy resins, Epoxy compounds, Sorption, Benzene, Filament wound construction, Anisotropy, Diffusion, Stresses, Organic solvents, Reaction kinetics.

An investigation was made of the effect of anisotropy on the sorption characteristics of benzene by a glass-epoxy composite material system. The work was conducted in three phases; the first being the characterization of the sorption of benzene by the homogeneous epoxy matrix; the second, an experimental study of the effect of anisotropy resulting from the unidirectional glass filaments on the sorption characteristics; the third, an experimental investigation into the role internal stresses generated as a result of the dilatation which accompanies the sorption of the organic solvent have in determining the response of the material system to the presence of the solvent.

AD-774 968/2GA PC$3.25/MF$1.45
Monsanto Research Corp St Louis Mo
FLOW ORIENTATION OF SHORT FIBERS IN RECTANGULAR CHANNELS,
Masaharu Takano. Feb 74, 40p Rept no. HPC-70-116
Contract N00014-67-C-0218, ARPA Order-876
Report on Monsanto/Washington Univ., ONR/ARPA Association project development of High Performance Composites.

Descriptors: *Fiber reinforced composites, Fabrication, Fibers, Orientation(Direction), Flow, Plastics, Fiber reinforcement, Matrix materials, Rheology.
Identifiers: Orientated fiber composites.

The effects of fiber concentration, die geometry and flow rate on the fiber behavior and flow properties of concentrated fiber suspensions are observed. The viscosity of resin used in model systems is as low as 55 poises. Rectangular channels are used to eliminate the optical distortion at channel walls.

AD-775 046/6GA PC$3.25/MF$1.45
Tel-Aviv Univ (Israel) School of Engineering
A NUMERICAL SOLUTION FOR THE PROBLEM OF AN IMPACTED FIBER-REINFORCED VISCOELASTIC HALF-SPACE,
Jacob Aboudi, and Yechiel Weitsman. Feb 73, 35p Rept nos. TAU-SOE-72/73, Scientific-3 AFOSR-TR-74-0041
Grant AF-AFOSR-2143-71

Descriptors: *Fiber reinforced composites, *Viscoelasticity, Impact, Numerical analysis, Israel.

The response of a time-dependent external load of a viscoelastic half-space reinforced by oblique elastic fibers is obtained. The viscoelastic matrix is assumed to be described by any model of viscoelasticity and the fibers are allowed to occupy arbitrary volume within the matrix and to possess any elastic moduli. A numerical method of solution is presented together with its stability and convergence, and the accuracy of the results are examined. (Author)

AD-775 117/5GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
ELASTIC CONSTANTS OF STOCHASTICALLY REINFORCED MATERIALS,
G. N. Savin, and L. P. Khoroshun. 31 Jan 74, 16p Rept no. FTD-HT-23-340-74
Edited trans. of mono. Mekhanika Sploshnoi Sredy i Rodstvennye Problemy Analiza, Leningrad, 1972 p437-444, by Louise E. Heenan.

Descriptors: *Elastic properties, *Composite materials, Fiber reinforcement, Numerical analysis, Translations, USSR.

AD-775 294/2GA Reprint
Tel-Aviv Univ (Israel) School of Engineering
STRESS WAVE PROPAGATION IN A LAMINATED PLATE UNDER IMPULSIVE LOADS,
Jacob Aboudi. 3 May 72, 17p AFOSR-TR-74-0210
Grant AF-AFOSR-2143-71
Revision of report dated 15 Dec 71.
Availability: Pub. in International Jnl. of Solid Structures, v9 p217-232 1973.

Descriptors: *Laminates, *Composite materials, Stresses, Impulse loading, Epoxy resins, Boron, Fiberglass, Israel.
Identifiers: *Fiber reinforced composites.

The problem of a laminated plate under impulsive normal stress loading is treated. The shearing stress on the surface of the plate is assumed to be zero. The laminates are perpendicular to the plate surfaces. The stresses resulting by the application of the load are computed by a stable finite-difference method which yields reliable results. Illustrations are given for boron-epoxy and glass-epoxy laminates, exhibiting the effect of the reinforcement volume ratios, elastic moduli, observer locations, plate thickness and applied load time durations. (Author)

AD-775 334/6GA PC$3.00/MF$1.45
Midwest Research Inst Kansas City Mo
THE FATIGUE AND IMPACT RESISTANCE OF DUAL-MATRIX BORON-ALUMINUM COMPOSITES.
Final rept.,
James R. Hancock, and G. Gordon Shaw. Feb 74, 14p
Contract N00014-70-C-0212

Descriptors: *Composite materials, *Aluminum, *Boron, Fatigue(Mechanics), Impact strength, Toughness, Diffusion, Fibers.
Identifiers: *Fiber reinforced composites, Aluminum matrix composites, Boron reinforced composites.

The effects of a soft, plastic interface zone and of heat treatments on the axial fatigue resistance and on the Charpy impact behavior of boron-6061 aluminum composites were determined. Interfacial microstructures and composite fatigue resistance were compared with those previously determined for current, state-of-the-art boron-6061 aluminum composites. It was concluded that (a) matrix crack-tip stresses are relatively unimportant in determining the axial fatigue resistance of boron-aluminum composites, (b) a soft, plastic interface zone will only be effective in improving fatigue resistance in composites with a high-strength metal matrix having poor toughness, and (c) phase-boundary migration into boron filaments may occur during boron-aluminum interdiffusion instead of inert-marker movement into the aluminum matrix. (Author)

AD-775 359/3GA PC$4.00/MF$1.45
TRW Inc Cleveland Ohio
THE MECHANICAL BEHAVIOR OF METAL MATRIX COMPOSITES.
Final rept. 1 Apr 72-30 Apr 73,
Scott T. Scheirer, and Istvan J. Toth. May 73, 92p* Rept no. TRW-ER-7274-9 AFML-TR-73-178
Contract F33615-72-C-1601

Descriptors: *Composite materials, Matrix materials, Metals, Aluminum, Titanium, Boron, Fiber reinforcement, Silicon carbides, Defects(Materials), Mechanical properties, Tensile properties, Fatigue(Mechanics), Creep.
Identifiers: *Fiber reinforced composites, Aluminum matrix composites, Titanium matrix composites, Boron reinforced composites.

A study of certain factors influencing tensile, fatigue, and creep behavior in B-Al and B/SiC-Ti composite materials was performed. The effects of controlled composite imperfections (including filament spacing defects, aligned filament breakage, and improper fiber-matrix bond condition) on tensile and fatigue behavior were investigated. Fatigue behavior of B/SiC-Ti was studied for a variety of loading conditions. (Modified author abstract)

AD-775 364/3GA PC$11.00/MF$1.45
Southern Research Inst Birmingham Ala
NONDESTRUCTIVE, THERMAL, AND MECHANICAL PROPERTIES EVALUATIONS OF COMPOSITE HEATSHIELD MATERIALS.
Final rept. Oct 71-Dec 72,
James R. Brown, Jr., H. G. Sanders, W. T. Engelke, and C. D. Pears. Jan 74, 614p AFWL-TR-73-189
Contract F29601-72-C-0042
Report on 'AHCA/AHP Material Property Characterization'.

Descriptors: *Composite materials, *Heat shields, Materials, Nondestructive testing, Thermal properties, Mechanical properties, Carbon, Carbon phenolic materials, Quartz phenolic materials.

The program involved material property characterization of both Advanced Heatshield Concept Assessment (AHCA) and Advanced Heatshield Program (AHP) materials. The first phase of this work involved nondestructive testing (NDT) characterization and evaluations of tensile, compressive, thermal expansion and thermal conductivity properties of arcs and plates of various AHP composite heatshield materials after simulated nuclear encounter by flyer plate impact. Physical and mechanical properties are presented as a function of the level of impact. A detailed discussion of the distribution of structure-change within the arcs is presented for all materials. The second phase of this work included quality control NDT of rings, arcs, and discs of various AHCA composite heatshield materials and a more extensive NDT characterization of selected rings and arcs from the quality control group. The results of the quality control inspections were also used to select certain rings for application to underground testing. (Author)

AD-775 534/1GA PC$3.25/MF$1.45
Duke Univ Durham N C Dept of Civil Engineering
FATIGUE AND SHAKEDOWN IN METAL MATRIX COMPOSITES.
Interim technical rept. no. 1,
George J. Dvorak, and J. Q. Tarn. Nov 73, 49p Rept no. Solid Mechanics Ser-7 AROD-9570.1-E
Grant DA-ARO-D-31-124-71-G103

Descriptors: *Composite materials, *Fatigue(Mechanics), Metals, Matrix materials, Fiber reinforcement, Fibers, Beryllium, Aluminum, Boron, Copper, Tungsten.
Identifiers: *Fiber reinforced composites, Metal matrix composites, Aluminum matrix composites, Copper matrix composites, Tungsten reinforced composites, Boron reinforced composites, Beryllium reinforced composites.

Simple mechanical models of unidirectional metal matrix composites are used to analyze elastoplastic deformation and shakedown in the matrix under cyclic composite loads. Both axial and off-axis loadings of a lamina are considered. It is shown that the fatigue limits of as-fabricated B-Al, Be-Al, W-Cu, and other composites generally coincide with the composite shakedown limits, because the matrix yield stresses and fatigue limits are equal. In heat-treated composites, the matrix yield stress is usually much higher than the fatigue limit, and matrix fatigue failure can take place in the shakedown state. The residual microstresses caused by heat treatment are estimated, and their influence on fatigue is discussed. A method for improvement of the fatigue resistance of heat-treated composites is proposed. (Modified author abstract)

N74-15626/6GA PC$4.25/MF$1.45
Old Dominion Univ., Norfolk, Va.

FINITE ELEMENT ANALYSIS OF A COMPOSITE MATERIAL INTERFACE.
Final Technical Report.
K. H. Murray. Aug 73, 44p NASA-CR-132341, TR-73-C1
Contract NAS1-9434

Descriptors: *Composite materials, *Finite element method, *Solid-solid interfaces, Analysis of variance, Matrix methods, Minerals, Poisson ratio, Thermal stresses.

For abstract, see STAR 1206

SLA-73-972 PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
EFFECT OF TEST SYSTEM RESPONSE TIME ON INSTRUMENTED CHARPY IMPACT DATA.
W. R. Hoover. Nov 73, 20p
Contract AT(29-1)-789

Descriptors: (*Charpy test, *Time dependence), (*Boron, *Composite materials), (*Silicon carbides, Composite materials), (*Aluminium alloys, Composite materials), Impact tests.

For abstract, see NSA 29 05, number 12485.

11E. Fibers and Textiles

AD-775 109/2GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
ADHESION OF EPOXY RESINS TO BASALT FIBERS,
G. D. Andreevskaya, Yu. A. Gorbatkins, and I. P. Ladygina. 4 Feb 74, 9p Rept no. FTD-HT-23-797-74
Edited trans. of mono. Fiziko-Khimiya i Mekhanika Orientirovannykh Stekloplastikov, n.p., 1967 p80-83, by K. L. Dion.

Descriptors: *Fibers, *Basalt, *Fiber reinforced composites,Epoxy resins, Adhesion, Minerals, Fiberglass, Composite materials, Translations, USSR.

Studies of the physicomechanical and adhesive properties of basalt fibers indicated the possibility of using them to obtain reinforced plastics.

AD-775 356/9GA PC$5.75/MF$1.45
Celanese Research Co Summit N J
PBI DYEING AND COLOR STABILIZATION.
Technical rept. (Final) Jul 71-Nov 73,
Kenneth A. Reinhart, Edward J. Powers, Gordon W. Calundann, and Charles P. Driscoll. Jan 74, 208p Rept no. S-2374 ASD-TR-73-49
Contract F33657-71-C-1129

Descriptors: *Benzimidazoles, Absorption, Reaction kinetics, Photochemical reactions, Organic solvents, Solvent dyes, Fabrics, Stability.
Identifiers: Colorfastness, *Polybenzimidazoles, *Dyeing.

PBI (polybenzimidazole) was dyed with disperse, cationic, acid, premetallized acid, fiber reactive, solubilized vat, and direct dye classes from pure solvents or aqueous emulsions. Most dyeclasses afforded good wash and dryclean fastness. Some dyes from each class offer better lightfastness and actually protect the PBI. Other dyes are destroyed by room lighting. Disperse dye diffusion, PBI absorption, Discoloration of PBI, PBI light stability, and the lightening effect of plasma was studied. Fifty pounds of PBI staple were dyed with acid dyes to two blue and three green shades. The fabrics were delivered to the Air Force for their evaluation.

N74-15211/7GA PC$2.75/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EFFECT OF CHROMIA DOPING OF THERMAL STABILITY OF SILICA FIBERS.
I. Zaplatynsky. Jan 74, 19p NASA-TM-X-2969, E-7619

Descriptors: *Chromium oxides, *Fibers, *Silicon dioxide, *Thermal stability, Ablative materials, Additives, Crystallization, Reentry vehicles, Thermal insulation.

For abstract, see STAR 1206

PAT-APPL-306 648 PC$3.00/MF$1.45
Department of the Air Force Washington D C
TREATMENT OF GRAPHITE FIBERS.
Patent Application,
R. J. Dauksys. Filed 29 Sep 72, 12p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Graphite, *Fibers, *Organic coatings, Oxidation, Heat treatment, Composite materials, Reinforcing materials, Patents.
Identifiers: PAT-CL-23-209, *Patent applications.

In the patent a method is provided for treating graphite fibers that comprises heating the fibers in an oxidizing atmosphere and then coating the fibers with a thermoplastic polymer. When used in the fabrication of composites, the treated fibers greatly enhance their interlaminar shear strength.

PAT-APPL-309 833 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
TREATMENT OF COTTON WITH GLYCIDYL METHACRYLATE USING IONIZING RADIATION.
Patent Application,
Ralph J. Berni, and James A. Harris. Filed 27 Nov 73, 10p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Cotton fabrics, *Durable press treating, Graft polymerization.
Identifiers: PAT-APPL-008-116-2.

The patent application concerns a method of instituting 'ease of processing' while imparting durable press properties to cellulosic textiles. It comprises of free radical polymerization grafting, followed by heat curing with a Lewis acid or base catalyst. An alternate procedure for attaining the final product consisting of etherification of sodium cellulosate with glycidyl methacrylate followed by crosslinking using ionizing radiation is also proposed.

PAT-APPL-314 651 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
USE OF SODIUM BISULFITE IN AN IMPROVED PROCESS FOR THE TREATMENT OF CELLULOSE TEXTILE MATERIALS WITH CARBAMATE FINISHING AGENTS AND SULFUROUS ACID.
Patent Application,
John D. Reid, Robert M. Reinhardt, Russell M. H. Kullman, and Norton A. Cashen. 13 Dec 72, 12p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Textile finishing, *Wrinkling, *Durable press treating, Formulations, Sodium sulfates, Additives.
Identifiers: PAT-CL-360-482-00C.

This invention relates to an improvement process for obtaining finished fabrics which have higher strength to wrinkle recovery relationship than that normally encountered in fabrics which have been treated for durable press properties with a methylol carbamate and sulfurous acid. Specifically, it relates to the addition of small quantities of sodium bisulfite to treatment formulations containing a methylol carbamate agent and sulfurous acid so that fabrics treated with said formulations will benefit by having higher strength at a given level of wrinkle recovery than fabrics similarly treated but without sodium bisulfite.

PATENT-3 694 256 Not available NTIS
Department of Agriculture, Washington, D.C.
PROCESS FOR RENDERING CELLULOSIC TEXTILES FLAME RETARDANT.
Patent,
Donald J. Daigle, Leon H. Chance, and George J. Drake, Jr. Filed 12 Jan 71, patented 26 Sep 72, 3p PAT-APPL-105 941,
Previously filed as 854 326, 29 Aug 69.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Fire resistant textiles, *Cellulose, Phosphines, Halohydrocarbons.
Identifiers: PAT-CL-117-136.

This invention relates to the triphenylphosphine adducts of haloalkyl phosphine oxides and to phosphine methylenes derived therefrom, which are useful as flame retardants for cellulosic textiles. More specifically, this invention relates to some new bis(halomethyl)phosphorylmethyltriphenylphosphonium halides, to new stable triphenylphosphine bis(halomethyl)phosphorylmethylenes, and to methods of their preparation.

PATENT-3 697 316 Not available NTIS
Department of Agriculture, Washington, D.C.
FIRE-RESISTANT ORGANIC PRODUCTS AND METHOD FOR PRODUCTION.
Patent,
John V. Benimate, Donald J. Daigle, George L. Drake, Jr., Wilson A. Reeves, and Darrell J. Donaldson. Filed 7 May 71, patented 10 Oct 72, 5p PAT-APPL-141 352,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Fire resistant textiles, *Textile finishing, *Phosphines, Polymers, Isocyanates, Isothiocyanates.
Identifiers: PAT-CL-117-136.

This invention relates to new phosphorus and nitrogen containing polymers, processes for their production, and processes of employing these polymers in the flameproofing of certain organic fibrous material on mixture of various fibers. In general, this invention relates to polymers capable of being produced by the reaction of a methylol phosphine compound of the formula (HOCH2)2P-R where P is trivalent, R is a HOCH2-,H-, alkyl, aryl or alicyclic group with a monomeric nitrogen compound which contains one, two, or three isocyanate or isothiocyanate radicals.

PATENT-3 698 854 Not available NTIS
Department of Agriculture, Washington, D.C.
PROCESS FOR PRODUCING FLAME RESISTANT ORGANIC TEXTILES.
Patent,
Darrell J. Donaldson, Floyd L. Normand, and George L. Drake, Jr. Filed 24 Jun 70, patented 17 Oct 72, 4p PAT-APPL-49 556,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Fire resistant textiles, *Textile finishing, Cellulose.
Identifiers: PAT-CL-8-116-P, Phosphonium compounds.

This invention relates to a process for rendering textiles flame resistant. More specifically, this invention relates to a process for rendering cellulosic and other organic textiles flame resistant upon treatment with one of several solutions containing a phosphorus compound and cyanamide-the phosphorus compound being tetrakis

(hydroxymethyl)phosphonium chloride (THPC) or a derivative related thereto--and a catalyst of the phosphoric acid type. Textile products treated by the process of the instant invention are durable to repeated launderings and continue to be flame resistant.

PATENT-3 698 857 Not available NTIS
Department of Agriculture, Washington, D.C.
FIBROUS CROSSLINKED (AMINOALKYL) AMINOCHLORODEOXY-CELLULOSE AND METHOD OF PREPARATION.
Patent,
Tyrone L. Vigo, Matthew F. Margavio, and Clark M. Welch. Filed 26 Jan 71, patented 17 Oct 72, 7p PAT-APPL-109 964,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Cotton fabrics, *Cellulose, *Chlorination, Wrinkling, Chlorine aliphatic compounds.
Identifiers: PAT-CL-8-116-2.

This invention relates to a method of introducing (aminoalkyl)amino substituents, together with chloro substituents, into cellulose molecules, as a means of preparing mixed derivatives of cellulose not hitherto described, but having novel properties and uses, particularly as textile materials and intermediates. The resulting fibrous mixed derivatives of cellulose have utility as textile materials and as intermediates for further substitution, graft polymerization and cellulose crosslinking processes leading to various other textile materials. It also provides a means of introducing a limited and controlled degree of cellulose crosslinking in cellulosic textiles, so as to impart increased wrinkle resistance in the wet state, and increased resistance to attack by cellulose solvents, without causing a loss of tensile strength during the crosslinking step. Another object of the present invention is to provide a means of rendering cellulosic textiles receptive to acid dyes which lack substantivity for native cellulose.

PATENT-3 702 230 Not available NTIS
Department of Agriculture, Washington, D.C.
USE OF POLYMER ADDITIVE TO IMPROVE THE OPTICAL BRIGHTENER ABSORPTION CHARACTERISTICS OF DURABLE-PRESS FABRICS.
Patent,
Eugene J. Blanchard, Gloria A. Gautreaux, and Robert J. Harper, Jr. Filed 7 Jan 71, patented 7 Nov 72, 5p PAT-APPL-104 782,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Cotton fabrics, *Textile finishing, Crosslinking, Brighteners.
Identifiers: PAT-CL-8-100.

This invention relates to the treatment of cellulosic textiles with improved crosslinking formulations. More particularly, this invention relates to the treatment of cotton and other cellulosic fabrics with solutions containing certain proportions of polyvinylpyrrolidone-polyacrylate copolymer in combination with a crosslinking agent and a suitable catalyst to produce a finished fabric or garment which in addition to having the qualities of durable press also is able to absorb optical brighteners from normal laundry detergents. The formulations are further improved upon addition of small quantities of polypropylene glycol and alkyl ethyleneoxide alcohol in that the treatment of fabrics with the improved formulations yields further improved all-around performance.

PATENT-3 702 753 Not available NTIS
Department of Agriculture, Washington, D.C.
PAD BATH FORMULATION OF IRON SALT, AMMONIUM OXALATE AND ZIRCONYL AMMONIUM CARBONATE.
Patent,
Charles J. Conner. Filed 21 Mar 72, patented 14 Nov 72, 8p PAT-APPL-236 591,
Previously filed as PAT-APPL-38 900, 19 May 70.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Dyeing, *Fungicides, *Textile processing, Cellulose.
Identifiers: PAT-CL-8-52.

This invention relates to a process for imparting to cellulosic materials an orange to brown mineral dyeing with resistance to washing and biological degradation. More specifically it relates to the formation and subsequent in situ deposition of complex mineral deposits derived from iron, manganese, and zirconium, with or without copper and mercury in cellulosic materials, to produce mineral dyeings and fungicidal mineral dyeings of said cellulosic materials for the purpose of producing new shades of orange to brown mineral dyeings by reduced processing procedures, resistant to actinic degradation, water washing, and biological degradation.

PATENT-3 702 754 Not available NTIS
Department of Agriculture, Washington, D.C.
FIBROUS (CARBOXYALKYLTHIO)-AND (CARBOXYARYLTHIO) CHLORODEOXYCELLULOSES AND METHOD OF PREPARATION.
Patent,
Tyrone L. Vigo, Matthew F. Margavio, and Clark M. Welch. Filed 24 Jan 71, patented 14 Nov 72, 8p PAT-APPL-109 962,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Cotton fabrics, *Cellulose, *Chlorination, Chlorine aliphatic compounds, Sulfur organic compounds.
Identifiers: PAT-CL-8-120.

This invention relates to a method of introducing carboxyalkylthio- or carboxyarylthio-substituents, together with chloro-substituents, into cellulosic molecules, as a means of preparing mixed derivatives of cellulose not hitherto described, but having novel properties and uses, particularly as textile materials and intermediates. The introduction of these groups is accompanied by a low, controlled degree of cellulose crosslinking using only a small fraction of the total number of the carboxyalkylthio or carboxyarylthio groups introduced, the resulting crosslinked (carboxyalkylthio)-chlorodeoxycelluloses or (carboxyarylthio)-chlorodeoxycelluloses retaining the fibrous form and yarn or fabric structure originally possessed by native, unmodified cellulose.

PATENT-3 705 004 Not available NTIS
Department of Agriculture, Washington, D.C.
PAD BATH FORMULATION OF IRON SALT, POTASSIUM PERMANGANATE, AMMONIUM OXALATE AND ZIRCONYL AMMONIUM CARBONATE.
Patent,
Charles J. Conner. Filed 21 Mar 72, patented 5 Dec 72, 8p PAT-APPL-236 590,
Previously filed as PAT-APPL-38 900, 19 May 70.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Dyeing, *Fungicides, *Textile processing, Cellulose.
Identifiers: PAT-CL-8-52.

This invention relates to a process for imparting to cellulosic materials an orange to brown mineral dyeing with resistance to washing and biological degradation. More specifically, it relates to the formation and subsequent in situ deposition of complex mineral deposits derived from iron, manganese, and zirconium, with or without copper and mercury, in cellulosic materials, to produce mineral dyeings and fungicidal mineral dyeings of said cellulosic materials for the purpose of producing new shades of orange to brown mineral dyeings by reduced processing procedures; resistant to actinic degradation, water washing, and biological degradation.

PATENT-3 714 813 Not available NTIS
Department of Agriculture, Washington, D.C.
BISPYRROLIDONE-FORMALDEHYDE ADDITION PRODUCTS AND THEIR USE AS CROSS-LINKING AGENTS WITH CELLULOSE.
Patent,
Sidney L. Vail. Filed 17 Feb 71, patented 30 Jan 73, 5p PAT-APPL-116 282,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Textile finishing, *Cellulosic resins, *Durable press treating, Cotton fabrics.
Identifiers: Pyrrolidones, PAT-CL-260-326-300, *Pyrrolidone/ethylidene-bis(N-hydroxymethyl).

This invention relates to the treatment of cellulosic textile materials to produce textiles having improved physical and chemical properties. Specifically, it relates to new textile treating agents and to the process for treating cotton or other cellulosic fabrics with these new chemical compounds thereby imparting to these fabrics wrinkle resistance and durable-press properties. More specifically it covers the production of N,N'-dimethylol derivatives of ethylidenebis-(2-pyrrolidones) which are useful in imparting increased resilience to cotton and other cellulosic fabrics.

PATENT-3 722 282 Not available NTIS
Department of Agriculture, Washington, D.C.
SPINNING A FILAMENT-WRAPPED STAPLE FIBER CORE YARN.
Patent,
Rafael Audivert Indarte. Filed 24 Sep 71, patented 27 Mar 73, 5p PAT-APPL-183 396,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Yarns, *Core yarns, Cotton, Filament yarns, Composite wrapping, Spun yarns.
Identifiers: PAT-CL-57-144.

This invention relates to yarn blending methods. Specifically, this invention relates to improved spinning techniques and yarn quality by blending a continuous filament with a fibrous core. It relates to method for wrapping a continuous man-made filament around a fibrous cotton core during the spinning process. Yarns spun by the method of this invention have been found superior in strength and strength variability over a plain cotton control yarn. The yarns produced by the method also are spun at much faster speed than that possible with cotton control.

PATENT-3 723 057 Not available NTIS
Department of Agriculture, Washington, D.C.
PROCESS FOR STABILIZING ORGANOPHOSPHORUS SOLUTIONS AND IMPARTING ROT AND FLAME RESISTANCE TO ORGANIC TEXTILE MATERIALS.
Patent,
Darrell J. Donaldson, and Donald J. Daigle. Filed 19 Jul 71, patented 27 Mar 73, 5p PAT-APPL-164 043,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Stabilizers(Agents), *Textile finishing, *Fire resistant textiles, Cotton fabrics, Ammonium compounds.
Identifiers: PAT-CL-8-116-P, *Phosphonium compounds.

The patent discusses metal salts which were found to stabilize tetrakis(hydroxymethyl)phosphonium hydroxide (THPOH)eammonium hydroxide solutions by formation of complexes thereby making it possible to apply THPOH to cotton fabric from a single bath without the use of gaseous ammonia.

PATENT-3 734 684 Not available NTIS
Department of Agriculture, Washington, D.C.
FLAME RETARDANT PHOSPHORUS CONTAINING FIBROUS PRODUCTS AND METHOD FOR PRODUCTION.
Patent,
Darrell J. Donaldson, Donald J. Daigle, George L. Drake, Jr., Wilson A. Reeves, and John V. Benimate. Filed 7 May 71, patented 22 May 73, 4p PAT-APPL-141 446,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Phosphines, *Textile processes, *Fire resistant textiles, Amines.
Identifiers: PAT-CL-8-183.

The patent describes a process in which methylol phosphine, methylol phosphines in combination with nitrogenous compounds of water soluble adducts of the phosphine and nitrogenous compounds are used to treat organic fibrous derivatives containing primary and/or secondary amino groups such as wool, leather, nylon and aminized cottons, etc., to produce fibrous derivatives which are glow, wrinkle-, rot- and shrink-resistant.

PATENT-3 734 685 Not available NTIS
Department of Agriculture, Washington, D.C.
CATALYSIS OF THE CELLULOSE-CYCLIC UREA REACTIONS BY BUILT-IN ACID GROUPS.
Patent,
Dorothy M. Perrier, and Ruth R. Benerito. Filed 15 Mar 72, patented 22 May 73, 4p PAT-APPL-234 960,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Textile finishing, *Durable press treating, Catalysts, Ureas.
Identifiers: PAT-CL-8-129.

It is well known in the prior art that the cellulose hydroxyls will react with substituted cyclic ureas in the presence of a catalyst. Usually these catalysts are added to the reagent solution and padded on to the fabric. The process described in the invention differs from the prior art in that the catalyst is incorporated first as an integral part of the cellulose matrix and thus is separated from the cyclic urea. The fabric padded in this manner will not react appreciably with the cyclic urea during storage at or near room temperature but will react immediately upon curing at high temperatures, i.e., greater than 100C. It is then possible to store the fabrics with the adhered reagent and pendant sulfonoethylated groups at or near room temperature, fashion the fabric into garments and then cure the garment without fear of premature crosslinking the fabric. The garment after curing will have permanent press properties.

PATENT-3 745 191 Not available NTIS
Department of Agriculture, Washington, D.C.
FLAME-RESISTANT ORGANIC TEXTILES THROUGH TREATMENT WITH HALOGEN CONTAINING SOLUBLE METHYLOL PHOSPHINE ADDUCTS.
Patent,
Donald J. Daigel, Wilson S. Reeves, and George L. Drake, Jr. Filed 7 May 71, patented 10 Jul 73, 4p PAT-APPL-141 447,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Fire resistant textiles, *Phosphines, *Textile processes, Additives, Alcohols.
Identifiers: PAT-CL-260-606-5-P.

The patent describes a process in which soluble methylol phosphine adducts which contain halogen atoms attached to aromatic carbon atoms are prepared by reacting tris(hydroxymethyl)phosphine with halogen substituted phenols which contain one or more hydrogens ortho or para to the phenolic hydroxyl group. These adducts are convenient and useful for (a) the preparation of flame-resistant polymers and (b) the preparation of flame- and glow-resistant organic fibrous materials and flame-, glow-, wrinkle-, and shrink-resistant woven and knit textiles which contain about 25% or more cellulosic fibers.

PATENT-3 749 552 Not available NTIS
Department of Agriculture, Washington, D.C.
SIMULTANEOUS INTRODUCTION OF QUATERNARY AMMONIUM SALT RESIDUES AND SULFONE RESIDUES INTO FIBROUS CELLULOSE.
Patent,
Stanley P. Rowland. Filed 9 Dec 70, patented 31 Jul 73, 4p PAT-APPL-96 608,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Textile finishing, *Cellulosic resins, *Durable press treating, Cotton fabrics, Quaternary ammonium salts, Sulfones, Crosslinking.
Identifiers: PAT-CL-008-116-200.

An object of this invention is to provide a simple and practical process for the preparation of cotton fabrics containing substituents bearing quaternary ammonium salt groups and crosslinks derived from divinyl sulfone and 'precursors' of divinyl sulfone. A further object is to prepare a cotton fabric which fabric has 'built-in' catalysts for the thermal reversibility of cross-linkages derived from divinyl sulfone and 'precursors' of divinyl sulfone. The process involves the introduction of quaternary ammonium salt residues and sulfone residues into fibrous cellulose.

PB-228 776/1GA PC$3.25/MF$1.45
Federal Housing Administration, Washington, D.C. Office of Underwriting Standards.
HUD STANDARD FOR CARPET.
Use of materials bulletin.
Nov 73, 34p* UM-44c

Descriptors: *Carpeting, *Standards, *Residential buildings, One family houses, Housing for the aged, Nursing homes, Federal programs, Requirements, Fibers, Tests, Yarns, Classifications, Durability, Flammability standards, Government policies.
Identifiers: Certification, Wall to wall carpeting, Multifamily dwellings, Semidetached dwellings, Minimum requirements.

Standard is operative in operative in conjunction with the HUD/FHA carpet certification program. Only carpet lines meeting it and so certified by an Administrator may be installed in HUD mortgage insurance and public housing programs. It covers wall-to-wall installation in multifamily, one and two family properties, housing for the elderly, and nursing homes. It details acceptable fibers, fiber blends, yarn structures, and backings. Tests and minimum requirements are specified for such characteristics as pile yarn weight, pile thickness, density, weight density, tuft bind, delamination and dry breaking strengths, moth repellency, shrinkage, colorfastness to light, water, and ozone, dry crocking, and flammability.

SLA-73-1055 PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
RIBBON METHOD FOR DETERMINING THE MECHANICAL PROPERTIES OF FILAMENTS.
R. H. Ericksen, and J. C. Swearengen. Dec 73, 16p Contract AT(29-1)-789

Descriptors: (*Filaments, *Mechanical properties), (*Beryllium, *Elasticity), Measuring methods, Strain gages, Young modulus.

For abstract, see NSA 29 05, number 12488.

11F. Metallurgy and Metallography

AAEC/E-270 PC$4.00/MF$1.45
Australian Atomic Energy Commission Research Establishment, Lucas Heights.
CORROSION OF ALUMINIUM IN PURE WATER AND DILUTE SOLUTIONS.
A. Berzins, J. V. Evans, and R. T. Lowson. Jul 73, 40p
U.S. Sales Only.

Descriptors: (*Aluminium, *Corrosion), (*Hifar reactor, Corrosion), (*Water, *Corrosive effects), Aluminium oxides, Aqueous solutions, Chemical reaction kinetics, Electric conductivity, Erosion, Films, Medium temperature, Oxidation, Oxygen, Ph value, Silicon oxides.

For abstract, see NSA 29 05, number 10642.

AD-774 827/0GA PC$4.00/MF$1.45
Massachusetts Inst of Tech Cambridge Dept of Metallurgy and Materials Science
INVESTIGATION OF SOLIDIFICATION OF HIGH STRENGTH STEEL.
Final rept.,
E. F. Fascetta, T. Z. Kattamis, R. Mehrabian, and M. C. Flemings. Dec 73, 85p AMMRC-CTR-73-49
Contract DAAG46-68-C-0043

Descriptors: *Steel, *Solidification, Microstructure, Mechanical properties, Iron, Hardness, Copper alloys, Tin alloys, Iron alloys, Carbon alloys, Silicon alloys.
Identifiers: Inclusions, Copper alloy 10Sn, Iron alloy 3C 4Si.

Electron microprobe investigation of the composition of inclusions in a unidirectionally solidified AISI low alloy steel revealed that the iron content of inclusions decreases with distance from the chill and increasing homogenization time, whereas the manganese content exhibits the inverse variation. Nickel and molybdenum remained unchanged. The effect of geometrical and compositional variations of sulfides during thermomechanical treatment on mechanical behavior was evaluated. An apparatus for rheocasting high temperature alloys in a vacuum or inert atmosphere was constructed. Cu10%Sn and Fe-3%C-4%Si alloys were successfully rheocast. The size and shape of the primary solid particles at .4 to .5 fraction solid after the first 30 minutes of mixing in the mushy zone are not influenced by the solidification path followed. In both alloys studied, the primary solid particles at .4 and .5 fraction solid were 350 micrometers to 700 micrometers in size, and spheroidal in shape. The thixotropic nature of the rheocast Cu-10%Sn samples when reheated and sheared suggests the possibility of thixocasting the alloy. (Modified author abstract)

AD-774 828/8GA PC$11.50/MF$1.45
Rockwell International Corp Thousand Oaks Calif Science Center
WEAR, FRICTION AND THERMAL FATIGUE OF GUN BARREL MATERIALS.
Final rept. 23 May-31 Dec 73,
W. M. Robertson. 21 Dec 73, 170p Rept no. SC558.4FR
Contract DAAP07-73-C-0582

Descriptors: *Gun barrels, *Wear, *Thermal fatigue, *Coatings, Steel, Chromium, Cobalt, Alumina, Tantalum alloys, Tungsten alloys, Strain(Mechanics), Loads(Forces), Composite materials.
Identifiers: Steel 4340, Tantalum alloy 10W.

Thermal fatigue tests were performed on the following materials: gun steel; 4340 steel; chromium plated gun steel; gun steel plated with a composite plate of chromium over alumina dispersion hardened cobalt; 4340 steel plated with the composite chromium-cobalt plate; and tantalum-10% tungsten. Temperatures were cycled over various ranges from a minimum of 350F to a maximum of 1535F. The tubular test specimens were heated by induction and cooled by passing air through the tube center. Diametral strain was measured and constrained to follow a preset temperature strain relation which provided either 0.2% or 0.8% plastic compressive strain in the specimen at the maximum temperature of the cycle. Loads required to maintain the preset strain were measured and time to specimen failure was determined. The application of these results to the optimization of wear resistant coatings on gun barrels is discussed. (Modified author abstract)

AD-774 865/0GA PC$3.00/MF$1.45
Office of Naval Research London (England)
THE INTERNATIONAL CONFERENCE ON THE STRENGTH OF METALS AND ALLOYS (3RD): THE MICROSTRUCTURE AND DESIGN OF ALLOYS, CAMBRIDGE, ENGLAND, HELD IN 20-25 AUGUST 1973.
Conference rept.,
Harry A. Lipsitt, and David S. Dickson. 28 Nov 73, 25p Rept no. ONRL-C-23-73

Descriptors: *Metals, *Alloys, *Symposia, Mechanical properties, Thermomechanics, Microstructure, Fatigue(Mechanics), Fracture(Mechanics), Great Britain.

The Third International Conference on the Strength of Metals Alloys, sponsored by the Institute of Metals, the Iron and Steel Institute, and the U.S. Army European Research Office, was held at Cambridge, England in August 1973. The topics covered in this Conference ranged over the following areas: Fundamental strengthening mechanisms, strengthening in commercial materials, interdependence of strength + ductility at low temperatures, creep strength + ductility, composites (metal matrix), particle hardening, formability + workability, fatigue, environmental influences in service, future materials design, solution hardening. This report summarizes some of the pertinent papers presented during the Conference. (Author)

AD-775 018/5GA PC$4.75/MF$1.45
Battelle Columbus Labs Ohio
FAST FRACTURE RESISTANCE AND CRACK ARREST IN STRUCTURAL STEELS.
Progress rept.,
G. T. Hahn, R. G. Hoagland, M. F. Kanninen, A. R. Rosenfield, and R. Sejnoha. Jun 73, 130p SSC-242
Contract N00024-72-C-5142

Descriptors: *Structural steel, *Fracture(Mechanics), Crack propagation, High strength alloys, Toughness, Steel.
Identifiers: Steel 4340, Steel 517-F.

The report presents findings of an Army Research Office supported study concerned with the response of high-strength steels to fast running cracks, and a separate Ship Structure Committee program dealing with unstable fractures in ship plates. Together, the results provide a new basis for measuring and characterizing the properties of structural alloys that control fast fracture and crack arrest. Measurements and calculations of unstable fracture and fracture arrest in 12.7 mm- and 25.4 mm-thick, high-strength SAE4340 steel and A517F steel plates are described. (Modified author abstract)

AD-775 092/0GA PC$6.50/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
DIFFUSION OF COBALT AND CHROMIUM IN COBALT OXIDE AND NICKEL OXIDE COMPACTS.
Master's thesis,
Mark H. Davis. Jun 71, 70p Rept no. GAW/MC/71-6

Descriptors: *Cobalt, *Chromium, *Diffusion, *Oxides, Evaporation, Single crystals, Tracer studies, Theses.
Identifiers: Chromium isotopes, Cobalt isotopes, Cobalt oxides, Nickel oxides.

Diffusion studies were made for Cr51 diffusion in single crystals of NiO and CoO and for Co60 and Cr51 in compacted NiO and CoO. An improved Gruzin method was used to analyze the data. Measurements were made at temperatures between 977C and 1243C at an oxygen partial pressure one atm. Due to chromium evaporation losses no equations were developed for single crystal diffusion. A discussion of the evaporation problem was given. The diffusion of the chromium in the compacted oxides did not fit the theoretical equations. The diffusion of cobalt followed the theoretical development. (Modified author abstract)

AD-775 148/0GA PC$14.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
THERMOMECHANICAL TREATMENT OF ALUMINUM ALLOYS.
M. Kh. Rabinovich. 31 Jan 74, 218p Rept no. FTD-MT-24-834-73
Edited machine trans. of mono. Termomekhanicheskaya Obrabotka Alyuminievykh Splavov, n.p., 1972, p1-161, by Dean F. W. /Koolbeck.

Descriptors: *Aluminum alloys, *Thermomechanics, Deformation, Heat treatment, Translations, USSR.

In the book an effort is made to generalize accumulated experience on thermomechanical treatment of aluminum alloys. The book outlines methods of combined deformation and heat treatment of aluminum alloys. The book contains 13 tables, 74 figures, and a bibliography of 89 titles.

AD-775 161/3GA Reprint
Lehigh Univ Bethlehem Pa Dept of Metallurgy and Materials Science
USE OF FLOATING ZONE MELTING TECHNIQUE FOR THE GROWTH OF NIOBIUM BICRYSTALS.
Interim rept.,
C. S. Pande, L. S. Lin, S. R. Butler, and Y. T. Chou. 2 Apr 73, 5p AFOSR-TR-74-0219
Grant AF-AFOSR-2326-72
Availability: Pub. in the Jnl. of Crystal Growth, v19 p209-210 1973.

Descriptors: *Niobium, *Crystal growth, *Zone melting.

A method of growing bicrystals of high melting point bcc metals using a floating zone technique is described. The method uses a special procedure in which a Y-shaped seed for the bicrystal is made from a partially split single crystal. Large niobium bicrystals of specified orientations (0.63 cm in diameter and over 10 cm in length) have been grown by this method. (Author)

AD-775 225/6GA PC$8.50/MF$1.45
Massachusetts Inst of Tech Cambridge Center for Materials Science and Engineering
STRUCTURE AND PROPERTY CONTROL THROUGH RAPID QUENCHING OF LIQUID METALS.
Final technical rept.,
N. J. Grant, Regis M. Pelloux, M. C. Flemings, and A. S. Argon. 22 Jun 73, 411p
Contract DAHC70-C-0283, ARPA Order-1608
See also report dated 31 Dec 72, AD-757 677.

Descriptors: *Powder metallurgy, *Hot pressing, *Quenching, Isostatic pressing, Solidification, Alloys, Thermomechanics, Liquid metals, Atomization, Mechanical properties, Microstructure, Maraging steels, Nickel alloys, Steel, Copper, Cobalt alloys.
Identifiers: Steel 18Ni, Nickel alloy IN-100, Cobalt alloy MAR-M-509, Steel 1045.

The report summarizes the results and accomplishments of a three year research program investigating the processing of billets from rapidly quenched liquid metals. Various powder metallurgy (P/M) and quench-casting techniques were employed to generate extremely fine dendrite arm spacings and homogeneous structures. Iron, nickel and cobalt-base alloy powders, produced by steam atmoization (coarse powders), argon atomization, vacuum atomization, and the rotating electrode process, were consolidated into dense billets by hot isostatic pressing (HIP) and/or extrusion. The hot working properties of P/M billets quench-cast bars were evaluated by high strain rate tests and creep (superplastic) testing. Two P/M superalloys, MAR-M-509 (cobalt-base) and IN-100 (nickel-base) after HIP and hot extrusion demonstrated excellent hot workability under high strain rate and creep forming conditions. Detailed analyses of microstructures, heat treatments and mechanical properties are presented for all P/M alloys and compared to equivalent cast materials. (Author)

AD-775 238/9GA PC$3.25/MF$1.45
Rensselaer Polytechnic Inst Troy N Y Materials Div
AN ELECTRON MICROSCOPIC EXAMINATION OF PRE-CRACK FATIGUE DAMAGE IN AGE HARDENED AL 5.0 ZN 2.5 MG.
Technical rept.,
David J. Duquette, and Peter R. Swann. Feb 74, 31p Rept no. TR-3
Contract N00014-67-A-0117-0012
Prepared in cooperation with Imperial Coll. of Science and Technology, London (England).

Descriptors: *Fatigue(Mechanics), *Aluminum alloys, Crack propagation, Electron microscopy, Dislocations, Age hardening, Magnesium alloys, Zinc alloys.
Identifiers: Aluminum alloy 2 1/2-Mg 5 Zn.

High cycle bending fatigue tests were performed on sheet specimens of an Al, 5.0 w/o Zn, 2.5 w/o Mg alloy. Electron microscopic observations of the free surfaces of the alloy sheets were performed on specimens cycled to crack initiation. These observations showed that low strain fatigue results in the generation of screw dislocations in the vicinity of surface connected grain boundary triple points. As cycling continues, these screw dislocations form jogs which are subsequently pinched off to form sessile edge dislocation loops. It is suggested that crack initiation occurs at a critical dislocation loop density in very narrow slip bands, and that the initiation step is affected by a normal component of stress across the slip plane as a result of dislocation dipole interaction. This normal stress results in a localized cleavage type of failure associated with Stage I cracking in high strength precipitation hardened alloys. (Modified author abstract)

AD-775 311/4GA PC$3.00/MF$1.45
Carnegie-Mellon Univ Pittsburgh Pa Metals Research Lab
THE EFFECT OF HYDROGEN ON THE DEFORMATION OF IRON.
Technical rept.,
I. M. Bernstein. Feb 74, 15p Rept no. CMU-036-099-1
Contract N00014-67-A-0314-0019

Descriptors: *Iron, *Deformation, *Hydrogen, Grain size, Crystal lattices, Stresses, Grain boundaries.

The role of hydrogen on the room temperature deformation behavior of low interstitial and

'interstitial-free' iron has been investigated. Experiments were carried out under dynamic cathodic polarization conditions to maintain a fixed level of dissolved hydrogen. Hydrogen reduces the flow stress relative to hydrogen free iron for all grain sizes in the interstitial-free iron; in the low interstitial iron, hydrogen reduces the flow stress for coarse-grained, while increasing it for fine grained samples. The results are rationalized by the different behavior of hydrogen at grain boundaries and in the lattice, and on the interaction between hydrogen and other solutes. (Author)

AD-775 358/5GA PC$6.00/MF$1.45
Titanium Metals Corp of America Henderson Nev
DEVELOPMENT OF ECONOMICAL SHEET TITANIUM ALLOY.
Final rept. 10 Apr 72-10 Nov 73,
T. L. Wardlaw, H. W. Rosenberg, and W. M. Parris. Dec 73, 250p* AFML-TR-73-296
Contract F33615-72-C-1696

Descriptors: *Titanium alloys, *Sheets, *Airframes, Forming techniques, Strain hardening, Deformation, Aluminum alloys, Chromium alloys, Tin alloys, Molybdenum alloys, Iron alloys, Vanadium alloys.
Identifiers: Titanium alloy 3Al 7Cr 4Sn 8V 1Zr, Titanium alloy 3Al 4Cr 2Fe 2Mo 8V, Titanium alloy 3Al 3Cr 3Sn 15V.

The objective of this program was to develop an economical sheet titanium alloy. The approach was to build on the earlier work with emphasis on mill product economics consistent with formability, fabricability, and other properties required by the ultimate user. Including alloys from the earlier contracts, more than 60 compositions were evaluated. These were narrowed to three final compositions, Ti-8V-7Cr-3Al-4Sn-1Zr, Ti-8V-4Cr-2Mo-2Fe-3Al, and Ti-15V-3Cr-3Al-3Sn. Further work is recommended on all three. Each alloy exhibits good strip producibility potential while meeting the airframe industries' stated cold minimum bend requirements. Each alloy showed Erichsen cup draw depths exceeding 0.35 in. after simulated strip processing to about .040 in. gage. (Author)

AD-775 395/7GA PC$5.25/MF$1.45
California Univ Los Angeles School of Engineering and Applied Science
THE USE OF SMALL PRE-CRACKED BEND SPECIMENS FOR QUALITY CONTROL PURPOSES.
Technical rept.,
Alan S. Tetelman, John N. Robinson, and Isaac Roman. Nov 73, 45p Rept nos. UCLA-ENG-7383, TR-12
Contract DAHC04-69-C-0008

Descriptors: *High strength alloys, Fracture(Mechanics), Toughness, Quality control, Steel, Aluminum alloys, Titanium alloys, Stainless steel, Crack propagation.

The difficulties involved in using valid ASTM (K sub Ic) specimens for quality control purposes are described. It is shown from tests on steels and titanium alloys that values of (K sub Ic) can be obtained at lower cost from small specimens. If fracture initiation occurs before general yield, (K sub Ic) can be determined from the load required to cause crack extension. If fracture occurs after general yield, (K sub Ic) can be determined from the critical plane strain crack tip opening displacement or from the notch root contraction. The effect of a steeply rising plane strain R-curve can be corrected by using a newly developed R-extrapolation technique. Simplified versions of the methods involved are described whereby small specimens can be used to determine whether a material satisfies specifications for quality control. These simplified versions require little or no calculation for quality control-testing once master nomographs have been drawn up. (Author)

AD-775 466/6GA PC$4.75/MF$1.45
General Dynamics Fort Worth Tex Convair Aerospace Div
NONDESTRUCTIVE TESTING TECHNIQUES FOR DIFFUSION BONDED TITANIUM STRUCTURES.
Final rept. 1 Dec 72-1 Oct 73,
John A. Regalbuto. Dec 73, 130p AMMRC-CTR-73-53
Contract DAAG46-73-C-0067

Descriptors: *Titanium alloys, *Nondestructive testing, *Diffusion bonding, Aluminum alloys, Vanadium alloys, Ultrasonic tests, X rays, Etching, Fractography, Defects(Materials), Fatigue(Mechanics).
Identifiers: Titanium alloy 6Al 4V.

This report describes the establishment of nondestructive testing techniques for diffusion bonded structures fabricated from Ti-6Al-4V sheet and forgings. Ultrasonic shear waves, radio frequency and signal-averaged pulse-echo techniques, x-ray, fluorescent penetrant, and blue-etch-anodize were used to inspect a series of diffusion bonded defect specimens. Analysis of NDT, mechanical property, and fractographic data indicated that shear wave inspection of the sheet material could be correlated with the observed decrease in fatigue life with deflect concentration. Shear strength of the sheet specimens was not affected by the presence of the internal defects to any measurable degree. Grain structure noise limited inspectability of the small (0.006-in. dia.) defects in the diffusion bonded forging. (Author)

AD-775 510/1GA PC$3.25/MF$1.45
California Univ Berkeley Dept of Materials Science and Engineering
GRAIN REFINEMENT THROUGH THERMAL CYCLING IN AN FE-NI-TI CRYOGENIC ALLOY.
Technical rept.,
S. Jin, J. W. Morris, Jr., and V. F. Zackay. Jan 74, 40p Rept no. TR-3
Contract N00014-69-A-0200-1062

Descriptors: *Iron alloys, *Nickel alloys, *Titanium alloys, *Grain size, Thermal cycling tests, Microstructure, Diffusion, Low temperature.
Identifiers: Iron alloy 12Ni 1/4-Ti, Grain refinement.

A thermal cycling technique which allows the grain refinement of Fe-12Ni-0.25Ti alloy in four cycles has been developed. The process consists of alternate annealing in gamma range and (alpha + gamma) range with intermediate air cooling. The transformation, microstructures and cryogenic mechanical properties on each cycling step are described. Due to the ultrafine grain size, the ductile-brittle transition temperature of this ferritic alloy in Charpy impact testing was suppressed below 6K. In fracture toughness testing at 77K, the mode of fracture was altered from brittle quasi-cleavage to complete ductile rupture through the grain refining. (Modified author abstract)

AERE-R-6284 PC$3.25/MF$1.45
Ukaea Research Group, Harwell. Atomic Energy Research Establishment.
GROWTH AND STABILITY OF VOIDS IN IRRADIATED METALS.
R. Bullough, B. L. Eyre, and R. C. Perrin. Dec 69, 23p
U.S. Sales Only.

Descriptors: (*Molybdenum, *Physical radiation effects), (*Stainless steels, Physical radiation effects), Cold working, Dislocations, Fast neutrons, Interstitials, Motion, Neutron beams, Pile neutrons, Point defects, Swelling, Temperature dependence, Vacancies, Voids.

For abstract, see NSA 29 05, number 10739.

BARC-683 PC$4.00/MF$1.45
Bhabha Atomic Research Centre, Bombay (India). Metallurgy Div.
PILOT PLANT STUDIES ON THE PRODUCTION OF DUCTILE TITANIUM SPONGE FROM PURE TITANIUM TETRACHLORIDE.
H. S. Ahluwalia, A. P. Kulkarni, P. L. Vijay, C. Subramanian, and K. Swaminathan. 1973, 38p
U.S. Sales Only.

Descriptors: (*Titanium, *Production), (*Titanium chlorides, *Reduction), Impurities, Pilot plants, Porosity.

For abstract, see NSA 29 05, number 12436.

BMI-X-629 PC$7.50/MF$1.45
Battelle Columbus Labs., Ohio (Usa).
CHARACTERISTICS OF COMMERCIAL VACUUM-HOT-PRESSED BERYLLIUM. SUMMARY REPORT.
S. H. Gelles, and J. H. Peterson. 1970, 109p
Contract W-7405-eng-92

Descriptors: (*Beryllium, *Mechanical properties), Chemical composition, Chemical properties, Density, Ductile-brittle transitions, Failures, Grain orientation, High temperature, Hot pressing, Medium temperature, Microstructure, Solid solutions, Strains, Tensile properties, Time dependence.

For abstract, see NSA 29 05, number 10666.

CEA-CONF-2226 PC$3.50/MF$1.45
METALLURGICAL DEVELOPMENTS AND APPLICATIONS OF ACTIVATION ANALYSIS.
R. Darras, C. Engelmann, and S. May. 1972, 26p
CONF-720704-3, SM-159/34
In French. U.S. Sales Only.

Descriptors: (*Metallurgy, Activation analysis), (*Activation analysis, *Uses), Chemical composition, Deuteron beams, Efficiency, Helium 3 beams, Helium 4 beams, Neutron beams, Nondestructive testing, Photon beams, Proton beams.

For abstract, see NSA 29 05, number 10639.

CEA-CONF-2267 PC$3.75/MF$1.45
EFFECTIVE CROSS SECTIONS FOR THE CREATION OF DAMAGES.
M. Lott, J. P. Genthon, F. Gervaise, P. Mass, and J. C. Mougniot. 6 Mar 73, 35p CONF-730302-15
In French. U.S. Sales Only.

Descriptors: (*Metals, *Physical radiation effects), (*Zirconium, Physical radiation effects), (*Molybdenum, Physical radiation effects), (*Tungsten, Physical radiation effects), Collisions, Differential cross sections, Gases, Neutron beams, Neutron spectra.

For abstract, see NSA 29 05, number 10741.

CEA-CONF-2423 PC$4.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France).
STUDY OF CREEP DEFORMATIONS UNDER COMPLEX APPLICATIONS IN AN AUSTENITIC STAINLESS STEEL. CREEP UNDER PROGRESSIVE LOAD AT HIGH TEMPERATURE.
J. N. Calvet, P. Le Bret, P. Petrequin, and G. Duret. 37p CONF-730726-9
In French. U.S. Sales Only.

Descriptors: (*Stainless steel-316, *Creep), (*Fuel cans, Creep), Deformation, High temperature, Strain hardening, Stresses, Tempering, Thickness, Time dependence.

For abstract, see NSA 29 05, number 10667.

CEA-CONF-2424 PC$3.50/MF$1.45
Cea Centre d'Etudes Nucleaires de Saclay, 91 - Gif-surtYvette (France).
MECHANICAL PROPERTIES OF THE HEXAGONAL TUBES AND JACKETS OF RAPSODIE. SWELLING OF THE STEEL OF THE HEXAGONAL TUBES OF RAPSODIE.
J. M. Dupouy, J. Erler, G. Allegraud, A. Bisson, and P. Blanchard. 29p CONF-730726-10
In French. U.S. Sales Only.

Descriptors: (*Stainless steel-316, *Physical radiation effects), Cold working, Creep, Density, Elasticity, Hardness, High temperature, Rapsodie reactor, Stresses, Swelling, Tubes.

For abstract, see NSA 29 05, number 10742.

COM-74-50150/3GA Not available NTIS
National Bureau of Standards, Washington, D.C.
THE CRYSTAL STRUCTURE OF THE METASTABLE PRECIPITATE IN COPPER-BASED COPPER-TITANIUM ALLOYS.
Final rept.,
D. E. Laughlin, and J. W. Cahn. 1974, 4p
Pub. in Scripta Metallurgica, v8 p75-78 1974.

Descriptors: *Copper alloys, *Titanium containing alloys, *Crystal structure, Electron diffraction.

Knight and Wilkes recently reported that the metastable ordered phase which forms by precipitation from copper-rich copper-titanium binary alloys is of the type L12. This note shows that this indexing is incorrect, and that the previously assigned structure of D1a is fully consistent with all experimental findings.

COO-1676-31 PC$3.75/MF$1.45
Case Western Reserve Univ., Cleveland, Ohio (Usa). Div. Of Metallurgy and Materials Science.
DISLOCATION-SOLUTE ATOM INTERACTIONS IN ALLOYS. TECHNICAL PROGRESS REPORT, FEBRUARY 1, 1973--JANUARY 31, 1974.
R. Gibala, A. K. Vasudevan, V. K. Sethi, J. A. Slane, and R. P. Krupitzer. 31 Oct 73, 32p
Contract AT(11-1)-1676

Descriptors: (*Alloys, *Research programs), (*Niobium, *Mechanical properties), Anisotropy, Annealing, Bcc lattices, Carbon, Dislocations, Impurities, Interactions, Oxygen, Stainless steels, Vacancies.

For abstract, see NSA 29 05, number 10684.

COO-2037-14 PC$6.25/MF$1.45
Ohio State Univ. Research Foundation, Columbus (Usa).
ELECTROTRANSPORT IN LIQUID METALS. FINAL REPORT.
D. A. Rigney. Nov 73, 83p
Contract AT(11-1)-2037

Descriptors: (*Liquid metals, *Electrophoresis), (*Sodium alloys, Electrophoresis), (*Potassium alloys, Electrophoresis), (*Silver alloys, Electrophoresis), Copper alloys, Gold alloys, Lithium alloys, Rubidium alloys.

For abstract, see NSA 29 05, number 10685.

COO-2107-9 PC$4.75/MF$1.45
Cincinnati Univ., Ohio (Usa).
CORRELATION OF SUBSTRUCTURE WITH MECHANICAL PROPERTIES OF PLASTICALLY DEFORMED AISI 304 AND 316 STAINLESS STEEL. PROGRESS REPORT, JANUARY 1--MARCH 31, 1973.
J. Moteff. 15 Jun 73, 53p

Descriptors: (*Stainless steel-304, *Mechanical properties), (*Stainless steel-316, Mechanical properties), (*Incoloy 800, *Microstructure), Annealing, Cold working, Correlations, Deformation, Electron microscopy, Hardness, Tensile properties.

For abstract, see NSA 29 05, number 12449.

COO-2204-10 PC$3.00/MF$1.45
Johns Hopkins Univ., Baltimore, MD. (Usa).
ACOUSTIC EMISSION AND THE PORTEVIN-LE CHATELIER EFFECT. PROGRESS REPORT, NOVEMBER 1, 1972--NOVEMBER 1, 1973.
W. F. Hartman. 1973, 6p
Contract AT(11-1)-2204

Descriptors: (*Strain hardening, *Acoustic emission testing), (*Metals, Acoustic emission testing), (*Alloys, Acoustic emission testing), Research programs.

For abstract, see NSA 29 05, number 12450.

COO-3027-15 PC$3.00/MF$1.45
Columbia Univ., New York (Usa). Liquid Metals Research Lab.
HIGH-TEMPERATURE THERMAL PROPERTIES OF LIQUID METALS, GASES, AND VAPORS. PROGRESS REPORT, OCTOBER 1, 1972--SEPTEMBER 30, 1973.
C. F. Bonilla. 1 Sep 73, 16p
Contract AT(11-1)-3027

Descriptors: (*Liquid metals, *Thermodynamic properties), (*Alkali metals, Thermodynamic properties), Gases, Vapors.

For abstract, see NSA 29 05, number 12452.

COO-3476-6 PC$7.50/MF$1.45
State Univ. Of New York, Stony Brook (Usa). Dept. Of Materials Science.
MICRO-STRUCTURAL AND SOLUTE EFFECTS ON THE MEGACYCLE DAMPING OF COPPER.
S. K. Banerji. Oct 73, 108p
Contract AT(11-1)-3476

Descriptors: (*Copper base alloys, *Damping), (*Nickel alloys, Damping), Chemical composition, Dislocations, Microstructure, Phonons, Quantity ratio, Ultrasonic waves.

For abstract, see NSA 29 05, number 12455.

EUR-5025 PC$6.75/MF$1.45
Commission of the European Communities, Ispra (Italy). Joint Nuclear Research Center.
DEVELOPMENT AND STUDY OF FOUR NEW ZIRCONIUM ALLOYS.
D. J. Boerman, P. Bonnet, G. C. Imarisio, F. Barigozzi, and C. Brera. Nov 73, 95p
In Italian. U.S. Sales Only.

Descriptors: (*Zirconium base alloys, *Mechanical properties), Chromium additions, Copper additions, Creep, Hydrides, Iron additions, Recrystallization, Tensile properties, Vanadium additions.

For abstract, see NSA 29 05, number 10686.

GKSS-73-E-10 PC$3.25/MF$1.45
INVESTIGATIONS ON STEAM GENERATOR TUBE SAMPLES OF INCONEL 600 AFTER LONG TERM SERVICE IN THE FDR.
D. Milferstaedt, F. Schmelzer, and F. J. Schmitt. 1973, 24p
In German. U.S. Sales Only.

Descriptors: (*Inconel 600, *Corrosion), (*Steam, *Corrosive effects), (*Steam generators, *Pipes), Layers, Otto hahn reactor, Oxidation, Oxides, Stability.

For abstract, see NSA 29 05, number 10645.

IS-T-608 PC$15.00/MF$1.45
Ames Lab., Iowa (Usa).
BONDING MODES OF SPECIES CHEMISORBED ON TUNGSTEN SINGLE CRYSTAL FACES.
L. W. Anders. Dec 73, 256p
Contract W-7405-eng-82

Descriptors: (*Tungsten, *Chemisorption), (*Hydrogen, *Binding energy), (*Nitrogen, Binding energy), (*Oxygen, Binding energy), Carbon monoxide, Desorption, Molecular orbital method, Monocrystals, Surfaces.

For abstract, see NSA 29 05, number 10646.

N74-14860/2GA PC$3.00/MF$1.45
National Aeronautical Lab., Bangalore (India). Propulsion Div.
RAPID ESTIMATION OF SILICON CONTENT IN ALUMINUM-SILICON ALLOYS BY MEANS OF DIRECT PERCENTAGE INDICATING THERMOMETRIC METHOD.
I. Sajo, and A. Sipos. 1972, 14p NAL-TR-146
Tran-Transl. Into English from Commun. From Steel Res. Inst. (Budapest), 1969 p 55-57.

Descriptors: *Aluminum silicates, *Quantitative analysis, *Silicon, *Thermophysical properties, Chemical analysis, Heat of solution, Reaction kinetics, Temperature measurement.

For abstract, see STAR 1206

N74-15182/0GA PC$4.75/MF$1.45
Carnegie-Mellon Univ., Pittsburgh, Pa. Metals Research Lab.
THE EFFECT OF MICROSTRUCTURE ON THE FRACTURE TOUGHNESS OF TITANIUM ALLOYS.
R. H. Vanstone, and J. R. Low, Jr.. Oct 73, 55p
NASA-CR-136553, TR-1-TI
Contract NGR-39-087-047

Descriptors: *Fracture strength, *Microstructure, *Titanium alloys, Aging (Materials), Fracture mechanics, Fractures (Materials), Mechanical properties.

For abstract, see STAR 1206

N74-15184/6GA PC$4.75/MF$1.45
National Aeronautical Lab., Bangalore (India).
EFFECT OF SHORT TIME HEATING UNDER LOAD ON THE PRECIPITATION HARDENING IN COMMERCIAL ALUMINUM ALLOYS.
G. Ziegler, and K. Welpmann. Nov 73, 47p NAL-TR-191, DLR-FB-71-111
Tran-Transl. Into English of "Einfluesse von Kurzzeitiger Erwaermung Unter Belastung Auf die Aushartung Technischer Aluminium-Legierungen", Dfvlr, Mater. Sci. Res. Inst., Porz-Wahn, West Germany, Report Dlr-FB-71-111.

Descriptors: *Aluminum alloys, *Heating, *Precipitation hardening, Electrical resistance, Electron microscopes, Tensile strength.

For abstract, see STAR 1206

N74-15185/3GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
PROPERTIES OF DISPERSION-STRENGTHENED CHROMIUM - 4-VOLUME-PERCENT-THORIA ALLOYS PRODUCED BY BALL MILLING IN HYDROGEN IODIDE.
A. Arias. Jan 74, 30p NASA-TN-D-7512, E-7620

Descriptors: *Chromium, *Metal working, *Powder metallurgy, *Tensile properties, *Thorium alloys, *Thorium oxides, Malleability, Mechanical properties, Physical properties, Precipitation hardening.

For abstract, see STAR 1206

N74-15188/7GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EXPLORATORY STUDY OF ELEVATED-TEMPERATURE TENSILE PROPERTIES OF ALLOYS BASED ON THE INTERMETALLIC COMPOUND TINI.
M. Garfinkle. Jan 74, 29p NASA-TN-D-7531, E-7584

Descriptors: *Intermetallics, *Temperature effects, *Tensile properties, *Titanium alloys, Embrittlement, Mechanical properties, Physical properties.

For abstract, see STAR 1206

N74-15189/5GA PC$3.25/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
INTERACTION OF INTERSTITIAL IMPURITIES WITH IRON SUBGROUP METALS IN AS-CAST MOLYBDENUM-BASED DILUTE SOLID SOLUTIONS.
N. V. Ageyev, N. N. Bokareva, Z. A. Guts, D. V. Ignatov, and M. M. Kantov. Jan 74, 22p NASA-TT-F-15281
Contract NASW-2481
Tran-Transl. Into English from the Book "Khimiya Metallicheskikh Splavov" Moscow, Nauka Press, 1973 p 114-123.

Descriptors: *Impurities, *Iron alloys, *Molybdenum alloys, *Solid solutions, Cobalt alloys, Interstitials, Mechanical properties, Nickel alloys.

For abstract, see STAR 1206

N74-15208/3GA PC$3.75/MF$1.45
National Aeronautical Lab., Bangalore (India).
EFFECT OF PLASTIC DEFORMATION ON THE AGE-HARDENING OF ALCUMG 1, ALCUMG 2 AND ALZNMGCU 0.5.
Y. Takeuchi. Oct 73, 33p NAL-TR-188, DLR-FB-71-91
Tran-Transl. Into English of "Einflue Einer Plastischen Verformung Auf das Kaltaushaertungsverhalten von Alcumg 1, Alcumg 2 and Alznmgcu 0.5", West German Report Dlr-RB-71-91, 1971.

Descriptors: *Aluminum alloys, *Plastic deformation, *Precipitation hardening, Elastic properties, Loads (Forces).

For abstract, see STAR 1206

N74-15210/9GA PC$2.75/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
PREPARATION AND EVALUATION OF THIN-FILM SODIUM TUNGSTEN BRONZES.
H. E. Kautz, W. L. Fielder, J. Singer, and J. S. Fordyce. Jan 74, 13p NASA-TM-X-2985, E-7668

Descriptors: *Bronzes, *Sodium alloys, *Thin films, *Tungsten alloys, Electrochemistry, Electrodes, Ion currents, X ray diffraction.

For abstract, see STAR 1206

ORNL-TM-4380 PC$3.75/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
INFLUENCE OF AGING ON THE IMPACT PROPERTIES OF HASTELLOY N, HAYNES ALLOY NO. 25, AND HAYNES ALLOY NO. 188.
H. E. McCoy, and D. T. Bourgette. Dec 73, 33p
Contract W-7405-eng-26

Descriptors: (*Hastelloy n, *Impact strength), (*Haynes 188 alloy, Impact strength), (*Haynes 25 alloy, Impact strength), Aging, Annealing, Fracture properties, High temperature, Medium temperature, Very high temperature.

For abstract, see NSA 29 05, number 10692.

ORNL-TM-4423 PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
ISOTOPIC POWER MATERIALS DEVELOPMENT PROGRESS REPORT FOR NOVEMBER 1971.
R. G. Donnelly. 26 Nov 73, 15p

Descriptors: (*Rhodium alloys, *Mechanical properties), (*Tungsten alloys, Mechanical properties), (*Platinum base alloys, Mechanical properties), (*Tantalum alloy-t111, Mechanical properties), Alloy-tzm, Bending, Capsules, Carbon monoxide, Degassing, Fractures, Hafnium additions, Impurities, Molybdenum alloys, Oxygen, Pioneer space probes, Radioisotope heat sources, Research programs, Rhenium alloys, Tensile properties, Titanium additions, Water vapor.

For abstract, see NSA 29 05, number 10693.

PAT-APPL-341 634 PC$4.00/MF$1.45
Department of the Air Force Washington D C
PROCESS FOR FABRICATING POROUS BERYLLIUM BILLETS.
Patent Application,
Stewart N. Rosenwasser. Filed 15 Mar 73, 13p
Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Beryllium, Powder metallurgy, Billets, Compacting, Pressing(Forming), Fabrication, Patents.
Identifiers: PAT-CL-75-200, *Patent applications.

The patent application describes porous beryllium billets prepared by cold isotactic pressing of a mold containing beryllium powder, and sintering under a vacuum the resulting beryllium billet. The billets so produced are particularly useful as a matrix material for active transpiration systems.

PATENT-3 816 296 Not available NTIS
Department of the Interior, Washington, D.C.
METHOD FOR REDUCTION OF REFRACTORY METAL OXIDE TO METAL BY CALCIUM CARBIDE.
Patent,
Morton M. Wong, and Ernst K. Kleespies. Filed 23 Sep 59, patented 9 Jan 62, 4p PAT-APPL-841 904, DOCKET/MIN-382
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Titanium, *Patents, Titanium oxides, Reduction(Chemistry), Refractory metals, Calcium carbide.
Identifiers: PAT-CL-75-84.

This invention relates to the reduction of refractory metal oxides capable of being reduced by calcium, employing calcium carbide and a flux. More particularly, it relates to a method wherein the flux is employed in such a manner as to reduce the contamination of the reduced metal with carbon.

PATENT-3 869 255 Not available NTIS
Department of the Interior, Washington, D.C.
PRODUCTION OF HIGH PURITY TITANIUM BY METALLIC SODIUM REDUCTION OF TITANIC HALIDE.
Patent,
Don H. Baker, Jr., and Vernon E. Homme. Filed 25 Nov 57, patented 18 Dec 62, 5p PAT-APPL-698 883, DOCKET/MIN-293
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Titanium, *Patents, Titanium halides, Sodium, Reduction(Chemistry), Titanium chlorides.
Identifiers: PAT-CL-75-84-5.

It is an object of the present invention to provide an improved method for the preparation of titanium having a relatively low Brinell hardness number, in relatively pure crystalline form. A further object of the invention is to provide a method for producing titanium wherein titanium tetrachloride is first reduced with sodium to lower valent chlorides, and then these latter are further reduced with additional sodium to titanium metal.

PATENT-3 875 900 Not available NTIS
Department of the Interior, Washington, D.C.
METHOD FOR SEPARATING MOLYBDENUM FROM TUNGSTEN BY ELECTROLYSIS FROM A FUSED ELECTROLYTE BATH.
Patent,
John B. Zadra, and John M. Gomes. Filed 25 Nov 60, patented 29 Jan 63, 3p PAT-APPL-71 835,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Molybdenum, *Tungsten, *Electrowinning, Molten salt electrolytes.
Identifiers: PAT-CL-204-64.

In the present invention, a scheelite ore containing molybdenum in an appreciable amount, is dissolved in a molten solvent to form an electrolyte, and placed in an electrolytic cell. Current is supplied between the electrodes, a suitable current density being maintained, to deposit out the molybdenum. After the molybdenum content is reduced to the degree desired, a new cathode is inserted and the current density is increased. Tungsten having a reduced molybdenum content is then deposited thereon.

PATENT-3 878 997 Not available NTIS
Department of the Interior, Washington, D.C.
FLOTATION PROCESS FOR CONCENTRATION OF PHENACITE AND BERTRANDITE.
Patent,
Richard Havens. Filed 24 Feb 61, patented 26 Feb 63, 5p PAT-APPL-101 616, DOCKET/MIN-507
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Beryllium, *Flotation, Sodium fluoride, Sodium phosphates.
Identifiers: PAT-CL-209-166, *Phenacite, *Bertrandite.

An object of this invention is to provide an improved froth flotation method for the separation, concentration and recovery of phenacite, bertrandite, and beryl from ores, with the production of a material of sufficient beryllium content to be used by extractive metallurgical processes. Water soluble inorganic fluoride and polyphosphates as conditioners are used.

PATENT-3 107 215 Not available NTIS
Department of the Interior, Washington, D.C.
FLOTATION PROCESS FOR CONCENTRATION OF POLLUCITE ORES.
Patent,
Karl C. Dean. Filed 25 Jan 62, patented 15 Oct 63, 4p PAT-APPL-168 848, DOCKET/MIN-497
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Flotation, *Cesium, Minerals, Amines.
Identifiers: PAT-CL-126-3, Pollucite.

This invention relates to separation or concentration of cesium-containing minerals from their ores in order to facilitate recovery of cesium metal or cesium salts.

PB-228 103/8GA PC$4.00/MF$1.45
Bureau of Mines, Washington, D.C.
COPPER RECOVERY FROM CHALCOPYRITE BY A ROAST-LEACH PROCEDURE.
Technical progress rept.,

P. R. Haskett, D. J. Bauer, and R. E. Lindstrom.
Mar 73, 16p BuMines-TPR-67
Prepared by Reno Metallurgy Research Center, Nev.

Descriptors: *Copper, *Roasting, *Leaching, Chalcopyrite, Sulfation, Iron oxides.

Sulfation roasting of chalcoprite concentrates, followed by water or dilute acid leach, was investigated as an alternative to conventional smelting. Cooper sulfation was found to be effectively promoted by the addition of materials such as Fe2O3 to the furnace charge. Conversion of the copper to a soluble form was essentially complete after roasting the mixed charge in the temperature range of 400 to 600C, using a Fe2O3 to chalcopyrite concentrate weight ratio of 1:2. (Author)

PB-228 107/9GA PC$4.50/MF$1.45
Michigan Univ., Ann Arbor. Cavitation and Multiphase Flow Lab.
INTERRUPTED JET WATER GUN IMPACT-EROSION STUDIES ON METALLIC ALLOYS.
Technical rept.,
F. G. Hammitt, J. B. Hwang, and Linh N. Do. Oct 73, 28p UMICH-01357-32-T
Grant NSF-GK-1889

Descriptors: *Erosion, *Nickel, *Aluminum, *Test equipment, Impact, Water jets.

Erosion test results are reported for water impact tests using an interrupted water jet for perpendicular and angled impact over the velocity range 400 to 600 m/s, using primarily aluminum 1100-0 and F, and nickel 270 as test materials. These materials were previously used in related tests for a 'Round Robin' test program conducted by Committee G-2 of ASTM. Photographs indicating the development of the damage patterns as a function of impact angle are included. (Modified author abstract)

PB-228 143/4GA PC$4.00/MF$1.45
Michigan Univ., Ann Arbor. Dept. of Mechanical Engineering.
INTERRUPTED JET WATER GUN IMPACT-EROSION STUDIES ON METALLIC ALLOYS,
F. G. Hammitt, J. B. Hwang, and Linh N. Do. Jan 74, 17p UMICH-01357-22-I
Grant NSF-GK-1889

Descriptors: *Erosion, *Test equipment, Impact, Water jets, Aluminum, Aluminum alloys, Nickel, Stainless steels, Polymethyl methacrylate, Stellite.
Identifiers: Aluminum alloy 6061, Cobalt alloy Stellite.

An interrupted water jet gun capable of producing elongated liquid slugs with diameter of about 1.0 mm, with velocities up to about 600 m/s and with repetition rate of about 40 slugs per minute has been used to measure the erosion resistance of various materials under this type of attack. The effects of velocity and angle of impingement in particular upon metallic materials are reported in this paper. (Modified author abstract)

PB-228 628/4GA PC$3.25/MF$1.45
Bureau of Mines, Washington, D.C.
INITIAL-STAGE SULFURIC ACID LEACHING KINETICS OF CHALCOPYRITE USING RADIOCHEMICAL TECHNIQUES.
Report of Investigations,
J. P. Baur, H. L. Gibbs, and M. E. Wadsworth. Jan 74, 44p BuMines-RI-7823
Prepared in cooperation with Bureau of Mines, Salt Lake City, Utah.

Descriptors: *Copper ores, *Leaching, *Sulfuric acid, Chalcopyrite, Reaction kinetics, Neutron irradiation, Copper isotopes, Iron isotopes, Sulfur isotopes, pH, Oxygen, Temperature, Isotopic labeling.
Identifiers: Tracer studies.

The sensitivity of radiochemical techniques makes possible the study of the initial-stage sulfuric acid leaching kinetics of chalcopyrite and other copper sulfide minerals. This Bureau of Mines study of the initial leaching of chalcopyrite used techniques to evaluate the molecular and electrochemical processes. High-grade Transvaal chalcopyrite was neutron-irradiated in a TRIGA reactor to produce radioisotopes copper-64, iron-59, and sulfur-35. Dissolution rates were measured in the time interval zero to 60 minutes, during which time significant anomalies were observed. The effects of solution variables such as pH, oxygen partial pressure, and ferric ion concentration at different temperatures were measured. (Modified author abstract) (Modified author abstract)

PB-229 336/3GA PC$6.00/MF$1.45
California Univ., Los Angeles. School of Engineering and Applied Science.
MISCIBILITY GAP AND SPINODAL SURFACE OF TERNARY REGULAR SOLUTIONS.
Interim rept.,
M. Murakami, D. de Fontaine, and I. P. Scheer. Jan 74, 57p UCLA-ENG-7407
Grant NSF-GH-32577

Descriptors: *Alloys, *Phase diagrams, *Solubility, Numerical analysis, Computer programs, Critical temperature.

Isothermal miscibility gap (MIGP) and spinodal (SPNDL) curves of ternary metallic systems were calculated by making use of the Newton-Raphson iteration technique applied to Meijering's method of calculation. The use of the Cook and Milliard relation between MIGP and SPNDL points allowed the determination of the starting values for the Newton-Raphson iteration without requiring any guesswork. This makes it possible to calculate MIGP and SPNDL isothermal curves of ternary systems for every one of Meijering's eight categories simply by using pair interaction parameters and temperatures as input data.

RD/B/M-2730 PC$3.00/MF$1.45
Central Electricity Generating Board, Berkeley (Uk). Berkeley Nuclear Labs.
STUDIES ON MATERIALS IN THE VICINITY OF SODIUM--WATER REACTIONS. PART 3. THE INFLUENCE OF SODIUM--WATER FLAMES ON THE FATIGUE ENDURANCE OF AISI 316 STAINLESS STEEL.
P. Marshall, R. N. Newman, and C. A. Smith. Aug 73, 15p CFR/SMWP/P-(73)79, CFR/BMWP/P-(73)159
U.S. Sales Only.

Descriptors: (*Stainless steel-316, *Corrosion), (*Sodium, *Chemical reactions), (*Water, Chemical reactions), Combustion, Embrittlement, Fatigue, Flames, Grain boundaries, Intergranular corrosion, Oxygen, Surfaces.

For abstract, see NSA 29 05, number 10647.

RD/B/N-2560 PC$3.00/MF$1.45
Central Electricity Generating Board, Berkeley (Uk). Berkeley Nuclear Labs.
LOW TEMPERATURE DIFFUSION OF CHROMIUM IN FINE GRAINED 20/25/NB STEEL WITH VARYING DISLOCATION DENSITIES.
A. F. Smith. Jul 73, 19p
U.S. Sales Only.

Descriptors: (*Stainless steel-20-25, *Diffusion), (*Chromium, Diffusion), Chromium, Crystal lattices, Dislocations, Fuel cans, Grain boundaries, Niobium additions, Niobium alloys, Tracer techniques.

For abstract, see NSA 29 05, number 10694.

RD/B/N-2683 PC$3.50/MF$1.45
Central Electricity Generating Board, Berkeley (Uk). Berkeley Nuclear Labs.

AUGER ELECTRON SPECTROSCOPY OF MATERIALS EXPOSED TO FLOWING SODIUM. PART 1.
Jun 73, 26p
U.S. Sales Only.

Descriptors: (*Stainless steel-304, *Corrosion), (*Stainless steel-316, Corrosion), (*Incoloy 800, Corrosion), (*Nickel base alloys, Corrosion), Auger effect, Chromium alloys, Chromium compounds, Compatibility, Corrosion products, Corrosive effects, Deposition, Electron microscopy, Iron, Liquid flow, Liquid metals, Lmfbr type reactors, Mass transfer, Nickel, Oxygen compounds, Particles, Sodium, Sodium compounds, Stainless steels, Surfaces.

For abstract, see NSA 29 05, number 10648.

SJE-138 PC$3.50/MF$1.45
Skoda, Plzen (Czechoslovakia).
PROPERTIES OF AUSTENITIC STAINLESS STEEL FOR NUCLEAR REACTORS.
K. Matejovic, and M. Staif. 1973, 26p
U.S. Sales Only.

Descriptors: (*Chromium-nickel steels, *Mechanical properties), (*Reactor materials, Chromium-nickel steels), Carbides, Cerium additions, Heat affected zone, Heat treatments, Intergranular corrosion, Molybdenum additions, Niobium additions, Temperature dependence, Trace amounts, Zirconium additions.

For abstract, see NSA 29 05, number 10699.

SLA-73-1053 PC$6.75/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
EXAMINATION OF SPR-II FUEL.
J. A. Horak, H. V. Rhude, and D. J. Sasmor. Sep 73, 91p
Contract AT(29-1)-789

Descriptors: (*Molybdenum alloys, *Nondestructive testing), (*Uranium, Nondestructive testing), (*Fuel elements, Nondestructive testing), (*Spr-2 reactor, Fuel elements), Chemical analysis, Density, Industrial radiography, Liquid penetrant inspection, Metallography, Spr-3 reactor, Ultrasonic testing.

For abstract, see NSA 29 05, number 10700.

UCRL-51463 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
COMPATIBILITY OF BORON NITRIDE IN LITHIUM SYSTEMS.
A. E. Morris. 9 Oct 73, 8p
Contract W-7405-eng-48

Descriptors: (*Boron nitrides, *Compatibility), (*Lithium, Compatibility), (*Refractories, *Chemical reactions), Dissolution, Liquid metals, Reaction kinetics, Very high temperature.

For abstract, see NSA 29 05, number 10604.

WAPD-TM-972 PC$6.25/MF$1.45
Bettis Atomic Power Lab., Pittsburgh, PA. (Usa).
CORROSION OF LWBR ZIRCALOY END CAP WELDMENTS (LWBR DEVELOPMENT PROGRAM).
S. Kass. Feb 73, 83p
Contract AT-11-1-GEN-14

Descriptors: (*Zircaloy 4, Welded joints), (*Welded joints, *Corrosion resistance), (*Lwbr type reactors, *Steam), (*Water, *Corrosive effects), Ammonia, Coolants, Electron beam welding, Gas tungsten-arc welding, High temperature, Hydrogen, Reactor cooling systems, Thickness, Tin alloys, Tubes, Zirconium base alloys.

For abstract, see NSA 29 05, number 10649.

11G. Miscellaneous Materials

PAT-APPL-419 748 PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
STRAIN ARRESTOR PLATE.
Patent Application.
M. H. Kural. Filed 28 Nov 73, 15p NASA-CASE-MSC-14182-1,
Contract NAS9-12083
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Bonding, *Metal plates, *Stresses, *Structural members, *Thermal insulation, *Tiles, Ceramics, Epoxy resins, *Patent applications.

An improved technique of attaching rigid thermal insulator tiles to metallic sub-panels or structural members on the exposed surfaces of spacecraft or other frameworks is described. Heretofore this has been done by a flexible bond, but it has been found that at temperatures below the glass transition range such bonds lose their flexibility and transfer more strains to the insulator tiles. The problem is solved by incorporation of a strain arrestor plate adjacent to the insulator tile and secured with an adhesive which may be either a flexible bond or a hard bond. Since most rigid thermal insulators are made of low expansion materials, Invar may be used for the plate, where weight is not a problem, but the preferred material is the lighter weight combination of fibers cast in a thermosetting resin. The preferred material is graphite fibers in an epoxy resin, built up in layers with various fiber orientations to obtain the desired strength, stiffness and thermal properties.

11I. Plastics

AD-774 769/4GA PC$3.25/MF$1.45
California Univ Berkeley Dept of Chemical Engineering
VISCOELASTIC RELAXATION TIMES OF A HOMOGENEOUS BLOCK COPOLYMER.
Technical rept.,
Mitchel Shen, and David R. Hansen. 15 Aug 73, 30p Rept no. TR-6
Contract N00014-69-A-0200-1053

Descriptors: *Polymers, *Viscoelasticity, *Stress relaxation, Polystyrene, Mathematical models.
Identifiers: *Block copolymers.

The molecular theory of viscoelasticity predicts that the maximum relaxation time of the block copolymer can be computed with the knowledge of submolecular sizes and monomeric friction coefficients. Stress-relaxation experiments were carried out for two samples of styrene-(alpha-methyl styrene)-styrene triblock copolymers. Maximum relaxation times were determined from the viscoelastic master curve through the use of Procedure X developed by Tobolsky and Murakami. Experimental results were found to be in satisfactory agreement with theoretical predictions. (Modified author abstract)

AD-775 172/0GA PC$3.00/MF$1.45
Forest Products Lab Madison Wis
COMPRESSIVE AND SHEAR PROPERTIES OF POLYAMIDE HONEYCOMB CORE.
Forest Service research note,
Edward W. Kuenzi, and Paul M. Jenkinson. 1974, 18p* Rept no. FSRN-FPL-0202-Rev
Contract F33615-69-M-5001

Descriptors: *Polyamide plastics, *Honeycomb cores, Compressive properties, Shear properties, Sandwich construction, Test equipment, Aircraft, Moisture.

Polyamide honeycomb cores of densities of 1.5, 3, and 6 pounds per cubic foot were evaluated in compression and shear. Compression data included properties at 75, 300, and 500F. Effects of high humidity and water soaking on compressive properties were also measured. Properties determined will enable engineers to arrive at rational designs of sandwich constructions using these cores. Descriptions of testing apparatus, testing procedures, and detailed results are included. (Author)

AD-775 398/1GA PC$8.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
PROGRESS IN SOVIET SCIENCE. SOME CONTRIBUTIONS OF A. A. ILYUSHIN TO MECHANICS OF POLYMERS, WITH COMMENTARY BY DR. ROY H. GEISS.
Special purpose document no. 5,
A. A. Ilyushin, and Roy H. Geiss. Dec 72, 100p
Rept no. FSTC-CW-01-05-73
Trans. of articles pub. in various journals.

Descriptors: *Polymers, *Viscoelasticity, Bibliographies, Translations, USSR.

A brief review is given of Russian approach to elasticity fundamentals, with reference to the expansion of stress and strain tensors into deviators and spherical tensors. A. A. Il'yushin's contribution to viscoelasticity using these concepts are given along with several of his papers in this area. A biography and bibliography of Il'yushin are also included.

AD-775 551/5GA Reprint
Massachusetts Inst of Tech Cambridge Dept of Mechanical Engineering
THE FRACTURE OF GLASSY POLYMERS,
M. J. Doyle, A. Maranci, E. Orowan, F. R. S. Stork, and S. T. Stork. 28 Feb 72, 24p AFOSR-TR-74-0211
Contract F44620-67-C-0060
Revision of report dated 2 Sep 71.
Availability: Pub. in Proceedings of the Royal Society of London A, v329 p137-151 8 Aug 72.

Descriptors: *Fracture(Mechanics), *Polymers, Crazing, Viscous flow.

The fracture of glassy polymers starts with the separation of molecule bundles which then form a craze; this is followed by the fracture or rupture of the craze by sliding of the molecule bundles. The repetition of this process results in the well known striation of the surface of fracture in polystyrene and other polymers. (Modified author abstract)

SC-M-720559 PC$8.50/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
STABILITY OF HIGH TEMPERATURE RESISTANT POLYMERS: A CRITICAL SURVEY.
C. Jr. Arnold. Sep 73, 128p

Descriptors: (*Organic polymers, *Stability), (*Aromatics, *Polymers), (*Heterocyclic compounds, Polymers), Bibliographies, Comparative evaluations, Diagrams, Pyrolysis, Reviews, Tables.

For abstract, see NSA 29 05, number 12479.

11J. Rubbers

N74-15287/7GA PC$3.50/MF$1.45
Explosives Research and Development Establishment, Waltham Abbey (England).
AN ASSESSMENT OF RECENTLY DEVELOPED THERMOPLASTIC POLYURETHANE AND POLYESTER ELASTOMERS.
J. Wright. Apr 73, 26p ERDE-TR-138, BR36668

Descriptors: *Aging (Materials), *Elastomers, *Mechanical properties, *Polyesters, *Polyurethane foam, Casting, Copolymers, Explosives, Molding materials, Performance tests, Thermoplastic resins, Weathering.

For abstract, see STAR 1206

11L. Wood and Paper Products

AD-774 786/8GA PC$6.50/MF$1.45
Forest Products Lab Madison Wis
COMPARISON OF WOOD PRESERVATIVES IN STAKE TESTS. (1973 PROGRESS REPORT).
Forest Service research note,
L. R. Gjovik, and H. L. Davidson. 1973, 69p Rept no. FSRN-FPL-02/73
See also report dated 1972, AD-740 374.

Descriptors: *Wood, *Protective treatments, Environmental tests, Biodeterioration, Fungusproofing, Tropical regions.
Identifiers: Pine wood.

Southern pine untreated control stakes have had an average life of about 1 year in the Canal Zone; 1.8 to 3.6 years in Mississippi, Florida, and Louisiana; and about 6 years in Wisconsin. Superficial treatments by 3-minute dipping and brushing with preservatives such as coal-tar creosote and petroleum oils containing copper naphthenate, zinc naphthenate, phenyl mercury oleate, and pentachlorophenol have added a few months to 4 years to the life of the untreated stakes. Some waterborne preservatives have provided less protection to the stakes than the standard preservative oils, such as coal-tar creosote and pentachlorophenol solutions, when preservative retentions have corresponded to those in commercial use. Other waterborne preservatives have shown excellent results in the exposure tests. (Modified author abstract)

PATENT-3 680 219 Not available NTIS
Department of Agriculture, Washington, D.C.
PROCESS FOR STEAM STRAIGHTENING AND KILN DRYING LUMBER.
Patent,
Peter Koch. Filed 22 Sep 70, patented 1 Aug 72, 8p PAT-APPL-74 484,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Straightening, *Drying, *Patents, *Lumber, Steam, Lilns.
Identifiers: PAT-CL-34-13-4.

The patent describes a process for steam straightening and kiln drying lumber, the lumber being held under total restraint with respect to warping during the process. The lumber is steam straightened and kiln dried to a moisture content of nine percent using a cross-circulation air velocity of 1000 f.p.m. at dry and wet bulb temperatures of 240F and 160F for a first interval followed by a second interval at 195F and 185F. The lumber is cooled prior to being released from restraint.

12. MATHEMATICAL SCIENCES

12A. Mathematics and Statistics

AD-774 854/4GA PC$3.75/MF$1.45
Wyoming Univ Laramie Coll of Commerce and Industry
STATISTICAL PROPERTIES OF FAST FOURIER TRANSFORM COEFFICIENTS COMPUTED FROM REAL-VALUED, COVARIANCE-STATIONARY, PERIODIC RANDOM SEQUENCES.
Research paper,
Leon E. Borgman. Sep 73, 63p Rept no. RP-23
Contract DACW72-72-C-0001

Descriptors: *Fourier transformation, Analysis of variance, Ocean waves, Sequences(Mathematics), Time series analysis, Spectrum analysis, Matrices(Mathematics), Mathematical prediction, Computations.
Identifiers: *Fast Fourier transform.

A systematic development of the probability properties of fast Fourier transform coefficients is presented as part of an investigation of the statistical precision of ocean wave directional spectra. Since the spectra were computed on the basis of the fast (also called 'finite') Fourier transform coefficients of the water level elevation, the probabilistic variations are relevant to the overall problem. The development also satisfies the purpose of providing a consistent set of conventions and definitions for this investigation. (Author)

AD-774 887/4GA PC$3.25/MF$1.45
George Washington Univ Washington D C Program in Logistics
COMPARISONS OF SMALL-SAMPLE POWER FOR TESTS OF EXPONENTIALITY,
Carl M. Harris. 1 Feb 74, 22p Rept no. Serial-T-286
Contract N00014-67-A-0214-0001

Descriptors: *Statistical tests, *Life tests, *Reliability, Mathematical prediction, Exponential functions, Monte Carlo method, Computer programs, Sampling.
Identifiers: Exponential density functions.

The paper is intended to provide some results to guide applied operations research analysts in the choice of a statistical test for determining whether a set of observations can be said to come from an exponential distribution. Power comparisons are made for a total of five tests against what are deemed to be the most popular alternatives for sample sizes of 10, 20, 30, and 40, and for a number of different possible parameter values. (Author)

AD-774 899/9GA PC$3.25/MF$1.45
Naval Ship Research and Development Center Bethesda Md
ACCURACY AND PRECISION OF ALGORITHMS FOR BESSEL FUNCTIONS OF FIRST KIND AND INTEGER ORDER,
T. Kooij. Oct 73, 38p Rept no. NSRDC-4259

Descriptors: *Bessel functions, *Computer programs, FORTRAN, Power series, Asymptotic series, Algorithms.
Identifiers: FORTRAN 4 programming language, CDC 6700 computers.

Three different algorithms--the power series, the asymptotic series, and the recurrence relation method--are investigated with special attention to the single (10 to the -14th power) and double precision (10 to the -29th power) of CDC 6000 Series computers. The final accuracy of each method depends partly on the magnitudes of the largest and smallest terms when floating point additions are involved. Another consideration is the number of terms required for each algorithm. Combination of all considerations leads to a partitioning of the order-argument domain into partially overlapping areas in which each algorithm is most appropriate. A wedged area not covered by any of the algorithms remains for large order and argument of approximately equal size. Orders and arguments up to 1024 were investigated and checked where possible. A FORTRAN IV program in the form of an external function is included. (Author)

AD-774 926/0GA PC$4.75/MF$1.45
Ultrasystems Inc Newport Beach Calif Operations Research and Economic Analysis Dept
INVESTIGATION OF DISTRIBUTION RECOVERY TECHNIQUES.
Final rept.,
Robert Curry, and Russell Egbert. 11 Feb 74, 150p
Contract N00014-72-C-0459

Descriptors: *Distribution functions, *Sampling, Estimates, Probability density functions, Approximation, Curve fitting, Theorems.

In the report, the general problem of estimating the underlying probability density function of an unknown distribution, given a random sample of observations, is investigated. Specific emphasis is placed on the one-dimensional or univariate case; however, recommendations are made as to how the n-dimensional case might be approached.

AD-774 970/8GA PC$3.00/MF$1.45
Cornell Univ Ithaca N Y Dept of Operations Research
A CONDITION FOR REALIZABILITY OF A SEQUENCE BY A HAMILTONIAN GRAPH.
Technical rept.,
Michael Koren. Nov 73, 12p Rept no. TR-205
Contract N00014-67-A-0077-0014

Descriptors: *Graphs, Network flows, Sequences(Mathematics), Theorems.
Identifiers: *Graph theory.

Erdos and Gallai characterized in a previous paper (1960) the sequences of integers which are realizable by (i.e., to be the degree sequence of) a simple graph. In this paper the author gives a constructive proof to their theorem and uses this method of proof to obtain a sufficient condition for a sequence to be realizable by a Hamiltonian graph. (Modified author abstract)

AD-774 971/6GA PC$3.00/MF$1.45
Cornell Univ Ithaca N Y Dept of Operations Research
NOTES ON RELIZATIONS OF SEQUENCES BY GRAPHS WITH FACTORS.
Technical rept.,
Michael Koren. Jan 74, 14p Rept no. TR-209
Contract N00014-67-A-0077-0014

Descriptors: *Graphs, Sequences(Mathematics), Network flows, Theorems.
Identifiers: *Graph theory, *Bipartite graphs.

Necessary and sufficient conditions for a pair of sequences to be realized by a bipartite graph without 1-factor are given. It is shown that k phi = (k(a sub 1),...,k(a sub n)) has a realization with a phi-factor, provided k phi and phi are realizable. It is shown that if phi has a realization with a k-factor it is also realizable by a graph having a k-factor which has a l-factor, for l = or < k, l dot n even. (Author)

AD-774 972/4GA PC$3.00/MF$1.45
Cornell Univ Ithaca N Y Dept of Operations Research
PAIRS OF SEQUENCES WITH A UNIQUE RELIZATION BY BIPARTITE GRAPHS.
Technical rept.,
Michael Koren. Feb 74, 18p Rept no. TR-214
Contract N00014-67-A-0077-0014

Descriptors: *Graphs, Sequences(Mathematics), Network flows, Theorems.
Identifiers: *Bipartite graphs, *Graph theory.

Pairs of sequences which have a unique realization by bipartite graphs (up to isomorphism) are characterized. (Author)

AD-774 995/5GA PC$3.75/MF$1.45
Systems Control Inc Palo Alto Calif
MODEL STRUCTURE DETERMINATION AND IDENTIFIABILITY PROBLEMS IN SYSTEM IDENTIFICATION.
Annual rept.,
Edison T. S. Tse, and Howard L. Weinert. Feb 74, 64p Rept no. SCI-5985-A
Contract N00014-72-C-0327
See also report dated Feb 73, AD-756 271.

Descriptors: *Control theory, Matrices(Mathematics), Identification, Linear systems, Invariance, Simulation, Errors.
Identifiers: *Systems identification, Parameter estimation.

Bounds for the probability of identification error are derived and a quantitative measure for identifiability is established. An error analysis for the basic identification procedure is presented, as well as simulation results for this procedure. Conditions for the identifiability of process and measurement noise covariances are derived. Complete sets of invariants for linear systems are presented. (Author)

AD-775 004/5GA PC$3.25/MF$1.45
Massachusetts Inst of Tech Cambridge Project Mac
SUPER-EXPONENTIAL COMPLEXITY OF PRESBURGER ARITHMETIC.
Technical memo.,
Michael J. Fischer, and Michael O. Rabin. Feb 74, 27p Rept no. MAC-TM-43
Contract N00014-70-A-0362-0003, Grant NSF-GJ-34671

Descriptors: *Mathematical logic, *Addition, Groups(Mathematics), Number theory, Algorithms, Theorems.
Identifiers: MAC project, Presburger arithmetic, Computational complexity, Abelian groups.

Lower bounds are established on the computational complexity of the decision problem and on the inherent lengths of proofs for two classical decidable theories of logic: the first order theory of the real numbers under addition, and Presburger arithmetic -- the first order theory of addition on the natural numbers. There is a fixed constant $c > 0$ such that for every (non-deterministic) decision procedure for determining the truth of sentences of real addition and for all sufficiently large n, there is a sentence of length n for which the decision procedure runs for more than (2 sup (cn)) steps. In the case of Presburger arithmetic, the corresponding bound is 2 sup (2 sup (cn)). These bounds apply also to the minimal lengths of proofs for any complete axiomatization in which the axioms are easily recognized. (Author)

AD-775 062/3GA PC$4.50/MF$1.45
Frank J Seiler Research Lab United States Air Force Academy Colo
A BAYESIAN APPROACH TO THE DESIGN AND ANALYSIS OF EXPERIMENTS FOR REGRESSION MODELS,
Salvatore J. Monaco. Jan 74, 119p Rept no. SRL-TR-74-0002

Descriptors: *Experimental design, *Bayes theorem, *Regression analysis, Decision theory, Estimates, Mathematical programming, Sampling, Sequential analysis.
Identifiers: Parameter estimation.

A Bayesian approach to the design and analysis of experiments for linear regression models is presented, where the objectives of the experiment are satisfied by a joint design criterion reflecting concern for both model discrimination and parameter estimation. Under the assumption of unknown variance, a probability mixture representing the state of the system is formulated and the procedure sequentially selects design points which maximize the posterior marginal variance of the response surface. Several stopping rules for termination of the experiment are proposed and a number of simulations illustrating the use of this procedure are included. Some advantages of this procedure are that it is easily implemented as an on-line controller and allows the experimenter maximum flexibility in allocating resources and deciding when to terminate experimentation. (Author)

AD-775 077/1GA Reprint
Stanford Univ Calif Dept of Electrical Engineering
ON DETERMINING THE IRRATIONALITY OF THE MEAN OF A RANDOM VARIABLE,
Thomas M. Cover. Jan 73, 13p AFOSR-TR-74-0199
Contracts F44620-69-C-0101, N00014-67-A-0112-0044

Prepared in cooperation with Harvard Univ., Cambridge, Mass. Dept. of Statistics and Massachusetts Inst. of Tech. Dept. of Electrical Engineering. Revision of report dated Dec 71.
Availability: Pub. in Annals of Statistics, v1 n5 p862-871 1973.

Descriptors: *Random variables, *Mean, Distribution functions, Probability, Measure theory, Theorems.
Identifiers: Statistical inference.

A complexity approach is used to decide whether or not the mean of a sequence of independent identically distributed random variables lies in an arbitrary specified countable subset of the real line. A procedure is described that makes only a finite number of mistakes with probability one. This leads to some speculations on inference of the laws of physics and the computability of the physical constants. (Author)

AD-775 090/4GA PC$9.75/MF$1.45
North Carolina Univ Chapel Hill Dept of Statistics
SOME RESULTS IN THE THEORY OF STOCHASTIC PROCESSES.
Interim rept.,
Alan J. Lee. Sep 73, 132p Rept no. Mimeo Ser-897
AFOSR-TR-74-0184
Contract AF-AFOSR-1415-68

Descriptors: *Stochastic processes, Hilbert space, Sampling, Measure theory, Approximation, Estimates, Theorems.
Identifiers: Stationary processes.

Consider a stochastic process (x(t), t belongs to T) of random elements of a Hilbert space H, whose index set is a locally compact Hausdorff space. The results obtained in this work fall into two broad categories, first the study of weakly stationary processes and their representations, and secondly the study of the sample path properties of not necessarily stationary processes. In each case, the author chooses the index set T and the Hilbert space H to be spaces appropriate to the investigation in hand. (Modified author abstract)

AD-775 093/8GA PC$4.00/MF$1.45
Florida State Univ Tallahassee Dept of Statistics
ON THE UNIVERSAL OPTIMALITY OF EXPERIMENTAL DESIGNS WITH UNEQUAL BLOCK SIZES AND UNEQUAL REPLICATIONS,
A. Hedayat. Jan 74, 13p Rept nos. FSU-Statistics-M285, TR-21 AFOSR-TR-74-0221
Grant AF-AFOSR-2581-74

Descriptors: *Experimental design, Optimization.
Identifiers: *Block design.

It is shown that in a family of competing experimental designs with unequal block sizes and unequal replications, a design which is completely symmetric is universally optimal. To show this the author used some optimality techniques recently developed by Kiefer. Two methods for the construction of the optimal designs are pointed out. As an application of these results it is shown that a resistant BIB design is two stage optimal. (Author)

AD-775 170/4GA Reprint
Rice Univ Houston Tex Dept of Mechanical and Aerospace Engineering and Materials Science
MODIFIED QUASILINEARIZATION ALGORITHM FOR OPTIMAL CONTROL PROBLEMS WITH BOUNDED STATE.
Interim rept.,
A. Miele, K. H. Well, and J. L. Tietze. Sep 73, 38p
AFOSR-TR-74-0185
Grant AF-AFOSR-2185-72
See also report dated 1972, AD-761 791.
Availability: Pub. in the Jnl. of Optimization Theory and Applications, v12 n3 p285-319 Sep 73.

Descriptors: *Control theory, Algorithms, Partial differential equations, Inequalities, Optimization.
Identifiers: Quasilinearization.

The paper considers the numerical solution of optimal control problems involving a functional I subject to differential constraints, a state inequality constraint, and terminal constraints. The problem is to find the state x(t), the control u(t), and the parameter pi so that the functional is minimized, while the constraints are satisfied to a predetermined accuracy. A modified quasilinearization algorithm is developed. Its main property is the descent property in the performance index R, the cumulative error in the constraints and the optimality conditions. Modified quasilinearization differs from ordinary quasilinearization because of the inclusion of the scaling factor (or stepsize) alpha in the system of variations. (Modified author abstract)

AD-775 175/3GA Reprint
Florida State Univ Tallahassee Dept of Statistics
RESISTANT AND SUSCEPTIBLE BIB DESIGNS.
Interim rept.,
A. Hedayat, and P. W. M. John. Mar 73, 14p
AFOSR-TR-74-0222
Grant AF-AFOSR-2527-73
Revision of report dated Apr 72.
Availability: Pub. in the Annals of Statistics, v2 n1 p148-158 1974.

Descriptors: *Experimental design, Matrices(Mathematics), Theorems.
Identifiers: *Block design.

AD-775 243/9GA PC$3.25/MF$1.45
Stanford Univ Calif Dept of Statistics
MAXIMUM LIKELIHOOD ESTIMATION IN THE BIRTH-AND-DEATH PROCESS.
Technical rept.,
Niels Keiding. 28 Nov 73, 26p Rept nos. TR-13, TR-51
Contracts N00014-67-A-0112, 0030, NSF-GP-30711
Prepared in cooperation with Copenhagen Univ. (Denmark).

Descriptors: *Stochastic processes, *Estimates, Sampling, Distribution functions, Random variables, Theorems.
Identifiers: *Birth and death processes, *Maximum likelihood estimation, Markov processes, Parameter estimation.

Maximum likelihood estimation of the parameters lambda and mu of a simple (linear) birth-and-death process observed continuously over a fixed time interval is studied. Asymptotic distributions for large initial populations and for large periods of observation are derived and some nonstandard results appear. The related problem of estimation from the discrete skeleton of the process is also discussed. (Author)

AD-775 244/7GA PC$3.25/MF$1.45
Stanford Univ Calif Dept of Statistics
THE EFFECT ON CLASSIFICATION ERROR OF RANDOM PERMUTATIONS OF THE FEATURES IN REPRESENTING MULTIVARIATE DATA BY FACES.
Technical rept.,
Herman Chernoff, and M. Haseeb Rizvi. 14 Dec 73, 21p Rept no. TR-80
Contract N00014-67-A-0112-0051
Prepared in cooperation with Sir George Williams Univ., Montreal (Quebec).

Descriptors: *Multivariate analysis, Permutations, Experimental design, Graphics, Classification.

A graphical method of representing multivariate data consists of having a computer draw a cartoon of a face which is determined by 18 parameters (features) including length of nose, curvature of mouth, slant of eyes, length of eyes, etc. If a sample of 8-dimensional vector observations is presented each component of a vector can be made to determine one of the 18 features and 10 constants can be selected for the remaining features. The resulting output is a series of faces, one for each 8 dimensional observation, which can be studied visually. An experiment was designed to evaluate the effect of a random permutation of the features on the visual ability to classify observations from two multivariate populations into two separate groups corresponding to the original populations. It is estimated that a random permutation may affect the error rate in this classification task by about 25%. (Author)

AD-775 270/2GA Reprint
Stanford Univ Calif Dept of Mathematics
INEQUALITIES IN THE THEORY OF UNIVALENT FUNCTIONS,
Menahem Schiffer. 1972, 10p AFOSR-TR-74-0257
Contract F44620-69-C-0106
Availability: Pub. in Inequalities, v3 p311-319 1972.

Descriptors: *Functions(Mathematics), *Inequalities, Matrices(Mathematics).
Identifiers: *Univalent functions.

In the theory of univalent functions inequalities appear frequently as an important tool. While they are not the ultimate aim of the analyst, their study and use have led to some interesting general insight into the nature of systems of inequalities. The author tries to stress this aspect of the theory in the paper.

AD-775 276/9GA Reprint
Stanford Univ Calif Dept of Electrical Engineering
AN INNOVATIONS APPROACH TO LEAST-SQUARES ESTIMATION. PART V. INNOVATIONS REPRESENTATIONS AND RECURSIVE ESTIMATION IN COLORED NOISE,
Thomas Kailath, and Roger A. Geesey. 22 Feb 73, 22p AFOSR-TR-74-0203
Contracts F44620-69-C-0101, N00014-67-A-0112-0044
See also Part 4 dated 30 Jul 71, AD-737 538.
Availability: Pub. in IEEE Transactions on Automatic Control, vAC18 n5 p435-453 Oct 73.

Descriptors: *Control theory, Least squares method, Estimates, Noise, Signal processing, Recursive functions.
Identifiers: Estimation theory, Riccati equation.

The authors show that least-squares filtered and smoothed estimates of a random process given observations of another colored noise process can be expressed as certain linear combinations of the state vector of the so-called innovations representation (IR) of the observed process. The IR of a process is a representation of it as the response of a casual and causally invertible linear filter to a white-noise 'innovations' process. For nonstationary colored noise processes, the IR may not always exist and a major part of this paper is devoted to the problem of identifying a proper class of such processes and of giving effective recursive algorithms for their determination. The IR can be expressed either in terms of the parameters of a known lumped model for the process or in terms of its covariance function. (Modified author abstract)

AD-775 278/5GA Reprint
Florida State Univ Tallahassee Dept of Statistics
ROBUSTNESS OF THE WILCOXON TEST TO A CERTAIN DEPENDENCY BETWEEN SAMPLES,
Myles Hollander, Gordon Pledger, and Pi-Erh Lin. Mar 73, 6p AFOSR-TR-74-0206
Grant AF-AFOSR-2058-71
Revision of report dated Nov 72.
Availability: Pub. in The Annals of Statistics, v2 n1 p177-181 1974.

Descriptors: *Statistical tests, *Sampling, Distribution functions, Hypotheses.
Identifiers: Robust procedures.

Robustness properties of the two-sample Wilcoxon test are established when the assumption of independence between samples is weakened to allow pairing. In particular, the test is shown to be (asymptotically) conservative when the bivariate distribution governing the pairing is positively quadrant dependent. (Author)

AD-775 280/1GA PC$3.00/MF$1.45
Naval Postgraduate School Monterey Calif
STATISTICAL ASPECTS OF LUMPABILITY HYPOTHESES FOR MARKOV CHAINS.
Technical rept.,
M. U. Thomas, and D. R. Barr. Dec 73, 13p Rept no. NPS-55BN55T073121A

Descriptors: *Stochastic processes, Matrices(Mathematics), Distribution functions, Hypotheses.
Identifiers: *Markov chains, Nonparametric statistics, Statistical inference.

Under certain conditions the state space of a discrete parameter Markov Chain may be partitioned to form a smaller lumped chain that retains the Markov property. The problem of formulating lumpability hypotheses when the transition probability matrix P is not known and, hence, must be estimated is discussed. An approximate test of these hypotheses is described based on well known non-parametric methods. The procedure is illustrated by an example. (Author)

AD-775 282/7GA PC$3.25/MF$1.45
Naval Postgraduate School Monterey Calif
PATTERN ANALYSIS: METHOD AND APPLICATIONS.
Technical rept.,
Ronald A. Weitzman. Sep 73, 42p Rept no. NPS-55WZ73091A

Descriptors: *Patterns, *Statistical analysis, Regression analysis, Discriminate analysis, Computations, Computer programs, Selection.
Identifiers: Psychometrics.

The report describes and illustrates a method of selecting items and scoring responses so as to produce maximal predictive validity for a specified criterion. The responses must be binary, e.g., correct/incorrect or yes/no. Results show that the method, stepwise pattern analysis, yields higher predictive validities for a small number of items than other methods do for many more. Through its ability to score both aptitude and biographical items together, moreover, pattern analysis can provide an automatic correction for possible test bias. (Author)

AD-775 292/6GA Reprint
California Univ Los Angeles Dept of Engineering Systems
AN EXTENDED QUASILINEARIZATION ALGORITHM,
R. G. Graham, and C. T. Leondes. 1973, 19p
AFOSR-TR-74-0201
Grant AF-AFOSR-2166-72
Availability: Pub. in Jnl. of Optimization Theory and Applications, v12 n3 p268-284 Sep 73.

Descriptors: *Boundary value problems, Numerical analysis, Computations, Matrices(Mathematics), Convergence, Optimization.
Identifiers: *Quasilinearization, Multipoint boundary value problems.

The quasilinearization algorithm for the solution of two-point boundary-value problems is extended to handle a general class of multipoint boundary value problems involving multiple subarcs, state and/or control variable inequality constraints, and discontinuous state and/or adjoint variables. The corner and final times are unspecified since they are implicitly defined by the satisfaction of subarc stopping conditions. The inequality constraints are handled directly without the use of penalty functions. The extended algorithm is applied to a discontinuous version of the brachistochrone problem, and good convergence properties are obtained. (Author)

AD-775 323/9GA Reprint
Wisconsin Univ Madison Dept of Mathematics
DUAL VARIATIONAL METHODS IN CRITICAL POINT THEORY AND APPLICATIONS,
Paul H. Rabinowitz, and Antonio Ambrosetti. 5 Apr 73, 34p
Contract N00014-67-A-0128-0024
Prepared in cooperation with Scuola Normale Superiore, Pisa (Italy) and Pisa Univ. (Italy). Inst. of Mathematics.
Availability: Pub. in Jnl. of Functional Analysis, v14 n4 p345-381 Dec 73.

Descriptors: *Functional analysis, Banach space, Partial differential equations, Integral equations, Theorems.
Identifiers: *Existence theorems, Variational methods.

The paper contains some general existence theorems for critical points of a continuously differentiable functional I on a real Banach space. The strongest results are for the case in which I is even. Applications are given to partial differential and integral equations. (Author)

AD-775 324/7GA Reprint
Wisconsin Univ Madison Dept of Mathematics
ON BIFURCATION FROM INFINITY,
Paul H. Rabinowitz. 20 Oct 72, 15p
Contract N00014-67-A-0128-0024
Prepared in cooperation with Aarhus (Denmark). Mathematics Inst.
Availability: Pub. in Jnl. of Differential Equations, v1r n3 p462-475 Nov 73.

Descriptors: *Differential equations, Banach space, Theorems.
Identifiers: *Bifurcation theory.

AD-775 341/1GA Reprint
New Mexico Univ Albuquerque
ESTIMATION OF PARAMETERS IN ACCELERATION MODELS,
William J. Zimmer, Raymond E. Williams, and George P. Steck. 1973, 4p
Contract N00014-68-A-0155-0003
Prepared in cooperation with Sandia Labs., Albuquerque, N. Mex. Sponsored in part by Atomic Energy Commission, Washington, D.C.
Availability: Pub. in Proceedings, Annual Reliability and Maintainability Symposium, Los Angeles, Calif., p428-431 Jan 74.

Descriptors: *Reliability, *Life tests, *Estimates, *Mathematical prediction, Sampling, Probability.
Identifiers: Random walk.

Regression and area type estimators are proposed for the parameter theta in the acceleration of ageing function $h(x) \approx 1 - (1-x)$ sup theta. The estimators for theta are based on distribution-free, random walk estimators for h developed by Steck and Zimmer. The proposed estimators are simple to compute and appear to have better properties than existing ones.

AD-775 399/9GA PC$16.75/MF$1.45
Stanford Univ Calif Dept of Statistics
ASYMPTOTIC PROPERTIES AND COMPUTATION OF MAXIMUM LIKELIHOOD ESTIMATES IN THE MIXED MODEL OF THE ANALYSIS OF VARIANCE.
Technical rept.,
John James Miller. 21 Nov 73, 274p Rept no. TR-12
Contract N00014-67-A-0112-0030

Descriptors: *Analysis of variance, Estimates, Asymptotic series, Matrices(Mathematics), Partial differential equations, Theorems, Theses.
Identifiers: *Maximum likelihood estimation, Parameter estimation, Asymptotic normality, Normal density functions.

The problem considered is the estimation of the parameters in the mixed model of the analysis of variance, assuming normality of the random effects and errors. Both asymptotic properties of such estimates as the size of the design increases and numerical procedures for their calculation are discussed. Estimation is carried out by the method of maximum likelihood. It is shown that there is a sequence of roots of the likelihood equations which is consistent, asymptotically normal and asymptotically efficient in the sense of attaining the Cramer-Rao lower bound for the covariance matrix as the size of the design increases. This is accomplished using a Taylor series expansion of the log-likelihood. (Modified author abstract)

AD-775 419/5GA PC$3.00/MF$1.45
University of Southern California Los Angeles Dept of Mathematics
QUALITATIVE PROPERTIES OF DIFFERENTIAL EQUATIONS.
Final rept. 1 Jul 64-15 Sep 73,
Henry A. Antosiewicz. 15 Feb 74, 9p AROD-5075.19-M
Contract DA-31-124-ARO(D)-265, Grant DA-ARO-D-31-124-71-G14
Sponsored in part by Grant DA-ARO-D-31-124-71-G176.

Descriptors: *Differential equations, Boundary value problems, Nonlinear differential equations, Control theory, Perturbation theory, Celestial mechanics, Applied mathematics.
Identifiers: Two point boundary value problems, Fixed point theorems.

Research was carried out in the following broad areas and is presented in the paper: General boundary value problems for nonlinear differential equations, including problems of controllability, fixed point theory and its applications; the theory of dynamical systems and the geometric properties of flows; and the analytic theory of differential equations, including perturbation theory in celestial mechanics; and, singular perturbations of two-point boundary value problems.

AD-775 427/8GA PC$3.00/MF$1.45
IBM Thomas J Watson Research Center Yorktown Heights N Y
COMBINATORIAL TOPICS IN LINEAR ALGEBRA.
Final rept. 15 Apr 72-31 Dec 73,
Alan J. Hoffman. 1974, 6p AROD-10127.11-M
Contract DAHC04-72-C-0023

Descriptors: *Combinatorial analysis, *Linear algebra, Inequalities, Experimental design, Eigenvectors.

The theme of work under this contract has been the interplay between combinatorics and linear algebra. The author gives brief summaries of the principal work accomplished under the contract.

AD-775 436/9GA PC$3.00/MF$1.45
Wisconsin Univ Madison
NONLINEAR VOLTERRA AND DELAY EQUATIONS.
Final rept. 1 Sep 64-8 Sep 73,
Jacob J. Levin, and John A. Nohel. 7 Feb 74, 6p
Rept no. 19 AROD-4936.25-M
Contract DA-31-124-(ARO(D)-266
See also report dated May 65, AD-528 088.

Descriptors: *Volterra equations, Asymptotic series, Reactor kinetics, Perturbation theory, Heat transfer, Applied mathematics.

Nonlinear Volterra and delay equations arise naturally in various branches of science, for example heat transfer, superfluidity, viscoelasticity, biology, genetics, nuclear reactor dynamics, and con-

trol theory. The study of the qualitative behavior of solutions of such equations is of intrinsic mathematical interest. Research under this contract can be divided into the following six categories: Asymptotic Behavior of Solutions of Volterra equations; Reactor dynamics; Perturbation theory for Volterra equations; A boundedness problem for a nonlinear Volterra equation arising in nuclear reactor kinetics; A nonlinear Volterra equation occurring in heat transfer and other problems; Asymptotic behavior of the bounded solutions of various functional equations.

AD-775 553/1GA Reprint
Stanford Univ Calif Dept of Mathematics
AN EXTREMAL PROBLEM FOR THE FREDHOLM EIGENVALUES,
M. Schiffer, and G. Schober. 29 Jun 71, 12p
AFOSR-TR-74-0258
Contract F44620-72-C-0031
Availability: Pub. in Archive for Rational Mechanics and Analysis v44 n2 p83-91 1971.

Descriptors: *Integral equations, *Conformal mapping, *Potential theory, Theorems.
Identifiers: *Fredholm equations, Dirichlet problem, Extremal problems.

A rigorous derivation of the algorithm to solve extremum problems for quasi-conformal mappings is presented. Application to the distortion problem for Fredholm eigenvalues is given under quasi-conformal mappings.

AD-775 558/0GA PC$3.25/MF$1.45
Wisconsin Univ Madison Dept of Computer Sciences
A NEW CLASS OF HIGHLY-STABLE METHODS: (A SUB 0) - STABLE METHODS.
Technical rept.,
Colin W. Cryer. Sep 73, 27p Rept no. WIS-CS-189-73
Contract N00014-67-A-0128-0004

Descriptors: *Differential equations, Numerical analysis, Matrices(Mathematics), Stability, Theorems.
Identifiers: *Multistep methods.

A linear multistep method (rho, Sigma) is defined to be (A sub 0) -stable if when it is applied to the equation x(t) = lambda x(t) the approximate solution (x sup h) (t sup n) tends to zero as (t sub n) nears infinity for all values of the stepsize h and all lambda (o, infinity). Various properties of (A sub 0) -stable methods are derived. It is shown that most of the properties of A(alpha) -stable methods are shared by (A sub 0) -stable methods. It is proved that there exist (A sub 0) -stable methods of arbitrarily high order. (Author)

AD-775 560/6GA PC$3.25/MF$1.45
Arizona State Univ Tempe Dept of Mathematics
SOME PIECEWISE POLYNOMIAL ALTERNATIVES TO SPLINES UNDER TENSION.
Technical rept.,
Gregory M. Nielson. Jan 74, 40p Rept no. TR-10
Contract N00014-72-A-0070-0002

Descriptors: *Splines, *Curve fitting, *Tension, Approximation, Interpolation, Theorems.
Identifiers: Spline approximation, Spline interpolation.

Splines under tension are analogs of the cubic spline (which is a simply supported, linear elastic beam) which allow for the application of uniform tension. This additional flexibility has proven to be useful in the application of spline functions to problems of curve design and curve fitting. In the paper, splines under tension are characterized as having a certain minimum property. This property motivates the characterization of some alternative splines which are piecewise polynomial as opposed to the normal splines under tension which are piecewise functions of the form a + bx + c.sinh (alpha x) + d.cosh (alpha x). These alternatives are shown to have many of the properties of splines in tension. (Author)

AD-775 585/3GA PC$3.75/MF$1.45
Wisconsin Univ Madison Mathematics Research Center
FOURIER SERIES IN THE COMPUTER AGE.
Technical summary rept.,
J. Barkley Rosser. Feb 74, 58p Rept no. MRC-TSR-1401
Contract DA-31-124-ARO(D)-462

Descriptors: *Fourier transformation, *Potential theory, *Fourier analysis, Computations, Computer applications.
Identifiers: Fast Fourier transform, Laplace equation, Poisson equation, *Fourier series, Dirichlet problem.

By using the Fast Fourier Transform, it becomes practical to use the classical Fourier series expansion of the solution of a Poisson equation for purposes of calculation. The paper discusses the flexibility this gives, especially if one wishes to deal with derivatives of the solution, for example if one has Neumann boundary conditions. (Modified author abstract)

COM-74-50053/9GA Not available NTIS
National Bureau of Standards, Washington, D.C.
AN INTEGRAL RELATED TO NUMERICAL INTEGRATION.
Final rept.,
S. Haber, and O. Shisha. 1973, 3p
Pub. in Bull. American Mathematical Society, v79 n5 p930-932 Sep 73.

Descriptors: *Numerical integration, Convergence, Theorems.

The question of the convergence of numerical integration formulas (of Riemann sum type) to the improper Riemann integral, taken from o to infinity, of f(x)dx is studied. A new integral over (zero to, but less than infinity), more restrictive than the improper Riemann integral but not absolutely convergent, is introduced. Necessary and sufficient conditions are found for a function to be integrable in the new sense; they are stated in terms of property of functions similar to the property of being of bounded variation. A convergence theorem for the numerical integration of such functions is given.

COM-74-50054/7GA Not available NTIS
National Bureau of Standards, Washington, D.C.
A QUADRATURE FORMULA OF DEGREE THREE.
Final rept.,
L. Flatto, and S. Haber. 1973, 9p
Pub. in Jnl. Approximation Theory, v9 n1 p44-52 Sep 73.

Descriptors: *Numerical integration, *Numerical quadrature, Group theory, Approximation.

COO-1469-220 PC$3.75/MF$1.45
Illinois Univ., Urbana (Usa). Dept. Of Computer Science.
EFFECT OF VARIABLE MESH SIZE ON THE STABILITY OF MULTISTEP METHODS.
C. W. Gear, and K. W. Tu. Apr 73, 35p
UIUCDCS-R-73-570
Contract AT(11-1)-1469

Descriptors: (*Interpolation, *Stability), (*Mathematics, Interpolation), Algorithms, Programming, Scalars, Variations.

For abstract, see NSA 29 05, number 12412.

COO-1469-221 PC$3.50/MF$1.45
Illinois Univ., Urbana (Usa). Dept. Of Computer Science.
STABILITY AND CONVERGENCE OF VARIABLE ORDER MULTISTEP METHODS.
C. W. Gear, and D. S. Watanabe. May 73, 28p
UIUCDCS-R-73-571
Contract AT(11-1)-1469

Descriptors: (*Mathematics, Interpolation), (*Interpolation, *Stability), Algorithms, Programming, Variations.

For abstract, see NSA 29 05, number 12413.

KFK-PDV-9 PC$3.50/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Datenverarbeitung in der Technik.
HARDWARE EXTENDED EXECUTIVE PRIMITIVES FOR PROCESS CONTROL SYSTEMS. 2. INTERMEDIATE REPORT: EXECUTIVE PRIMITIVES FOR WORKING SPACE MANAGEMENT.
M. Rupp. Jul 73, 27p
In German. U.S. Sales Only.

Descriptors: (*Process control, *Optimization), Computers, Control systems.

For abstract, see NSA 29 05, number 12421.

N74-15301/6GA PC$3.25/MF$1.45
Technion - Israel Inst. of Tech., Haifa. Dept. of Aeronautical Engineering.
ON THE TERMINAL CONTROL PROBLEM.
A. M. Steinberg, and K. Shmueli. Jun 72, 22p
TAE-156

Descriptors: *Algorithms, *Optimal control, Relaxation time, Sequencing, Transferring, Vectors (Mathematics).

For abstract, see STAR 1206

N74-15302/4GA PC$3.00/MF$1.45
Technion - Israel Inst. of Tech., Haifa. Dept. of Aeronautical Engineering.
ON EXISTENCE OF OPTIMAL CONTROLS.
A. M. Steinberg, and H. L. Stalford. Jul 72, 21p
TAE-158

Descriptors: *Hamiltonian functions, *Optimal control, Convexity, Equations of state, Linear systems.

For abstract, see STAR 1206

N74-15303/2GA PC$5.00/MF$1.45
Technion - Israel Inst. of Tech., Haifa. Dept. of Aeronautical Engineering.
CONVERGENCE PROPERTIES OF THE PARAMETER VECTOR IN REAL TIME IDENTIFICATION OF LINEAR SYSTEMS.
S. J. Merhav, and E. Gabay. Oct 72, 57p TAE-166
Subm-Sponsored by Min. Of Def.

Descriptors: *Convergence, *Linear systems, *Real time operation, Coefficients, Covariance, Differential equations, Vectors (Mathematics).

For abstract, see STAR 1206

N74-15304/0GA PC$8.75/MF$1.45
Case Western Reserve Univ., Cleveland, Ohio. Dept. of Mathematics and Statistics.
KULLBACK-LEIBLER INFORMATION FUNCTION AND THE SEQUENTIAL SELECTION OF EXPERIMENTS TO DISCRIMINATE AMONG SEVERAL LINEAR MODELS.
Ph.D. Thesis.
S. M. Sidik. 7 Jun 72, 135p NASA-CR-136615
Subm-Sponsored by NASA.

Descriptors: *Experimental design, *Information theory, *Probability theory, *Sequential analysis, Computerized simulation, Data sampling, Dependent variables, Distribution functions, Linearity.

For abstract, see STAR 1206

N74-15305/7GA PC$3.50/MF$1.45
National Physical Lab., Teddington (England). Div. of Numerical Analysis and Computing.
CUBIC-SPLINE FITTING WITH CONVEXITY AND CONCAVITY CONSTRAINTS.
M. G. Cox. Jun 73, 30p NPL-NAC-23

Descriptors: *Algorithms, *Approximation, *Linear equations, *Spline functions, Concavity, Convexity, Data smoothing, Fitting, Problem solving.

For abstract, see STAR 1206

N74-15306/5GA PC$4.50/MF$1.45
National Physical Lab., Teddington (England). Div. of Numerical Analysis and Computing.
NUMERICAL QUADRATURE. A SURVEY OF AVAILABLE ALGORITHMS.
V. A. Dixon. Jun 73, 46p NPL-NAC-36
Subm-Sponsored by Ukaea.

Descriptors: *Algorithms, *Quadratures, Integral equations, Numerical analysis.

For abstract, see STAR 1206

N74-15307/3GA PC$3.25/MF$1.45
National Physical Lab., Teddington (England). Div. of Numerical Analysis and Computing.
AVAILABLE ALGORITHMS FOR CURVE AND SURFACE FITTING.
J. G. Hayes. Jul 73, 24p NPL-NAC-39
Conf-Presented at the Ima Conf. On Software for Numerical Math., Loughborough, Engl., Apr. 1973.

Descriptors: *Algorithms, *Curve fitting, *Data smoothing, Computer programs, Least squares method, Linearity, Polynomials, Spline functions.

For abstract, see STAR 1206

N74-15308/1GA PC$3.50/MF$1.45
National Physical Lab., Teddington (England). Div. of Numerical Analysis and Computing.
A DATA-FITTING PACKAGE FOR THE NON-SPECIALIST USER.
M. G. Cox. Jul 73, 28p NPL-NAC-40
Subm-Submitted for Publication.

Descriptors: *Computer programs, *Data smoothing, *Spline functions, Algorithms, Approximation, Polynomials.

For abstract, see STAR 1206

N74-15309/9GA PC$3.00/MF$1.45
Eidgenossische Technische Hochschule, Zurich (Switzerland).
AN ITERATION THEORETICAL APPROACH TO THE CONCEPT OF TIME.
G. Targonski. 1973, 6p
Conf-Presented at the Intern. Colloq. On Point Mapping and Its Appl., Toulouse, 10-14 Sep. 1973; Sponsored by the Lab. D'Autom. Et d'Anal. Des Systems of the Cnrs.

Descriptors: *Differential equations, *Group theory, *Iterative solution, *Time functions, Abel function, Automata theory, Boundary value problems, Conformal mapping, Continuity (Mathematics), Functional analysis, Imbeddings (Mathematics), Irreversible processes.

For abstract, see STAR 1206

N74-15310/7GA PC$3.00/MF$1.45
Eidgenossische Technische Hochschule, Zurich (Switzerland).
OSCILLATIONS IN A CLASS OF PULSE CONTROL SYSTEMS.
M. Mansour. 1973, 12p
Conf-Presented at the Intern. Colloq. On Point Mapping and Its Appl., Toulouse, 10-14 Sep. 1973; Sponsored by the Lab. D'Autom. Et d'Anal. Des Systemes of the Cnrs.

Descriptors: *Iterative solution, *Nonlinear equations, *Oscillations, *Pulse duration modulation, *Sampling, Control theory, Error analysis, Existence theorems, Limits (Mathematics), Matrices (Mathematics), Newton-raphson method.

For abstract, see STAR 1206

N74-15311/5GA PC$3.00/MF$1.45
Centre National de la Recherche Scientifique, Toulouse (France). Lab. d'Automatique et d'Analyse des Systemes.
ON THE OBTENTION OF ENTIRE CREMONA TRANSFORMATIONS, OSCULATING AN ANALYTIC AREA-PRESERVING MAPPING SUR L'OBTENTION DE TRANSFORMATIONS ENTIERES CREMONIENNES OSCULATRICES A UNE TRANSFORMATION PONCTUELLE ANALYTIQUE CONSERVANT LES AIRES.
L. Hsu, and J. Bernussou. 1973, 10p
Conf-Presented at the Intern. Colloq. On Point Mapping and Its Appl., Toulouse, 10-14 Sep. 1973; Sponsored by the Lab. D'Autom. Et d'Anal. Des Systemes of the Cnrs.
Language in French.

Descriptors: *Approximation, *Conformal mapping, *Conservation equations, *Double cusps, *Iterative solution, Approximation, Differential equations, Dynamic response, Points (Mathematics).

For abstract, see STAR 1206

N74-15312/3GA PC$3.00/MF$1.45
Centre National de la Recherche Scientifique, Toulouse (France). Lab. d'Automatique et d'Analyse des Systemes.
CLOSED INVARIANT CURVES OF NON-LINEAR RECURRENCE RELATIONSHIPS CLOSE TO A CONSERVATIVE LINEAR RECURRENCE OF THE SECOND ORDER SUR LES COURBES INVARIANTES FERMEES DES RECURRENCES NON LINEAIRES VOISINES D'UNE RECURRENCE LINEAIRE CONSERVATIVE DU 2E ORDRE.
C. Mira. 1973, 13p
Conf-Presented at the Intern. Colloq. On Point Mapping and Its Appl., Toulouse, 10-14 Sep. 1973; Sponsored by the Lab. D'Autom. Et d'Anal. Des Systemes of the Cnrs.
In French; English Summary.

Descriptors: *Curves (Geometry), *Invariance, *Recursive functions, Approximation, Branching (Physics), Conservation equations, Differential equations, Independent variables, Nonlinear equations, Real variables.

For abstract, see STAR 1206

N74-15313/1GA PC$3.00/MF$1.45
Centre National de la Recherche Scientifique, Toulouse (France). Lab. d'Automatique et d'Analyse des Systemes.
SOME EXAMPLES OF BOUNDED STOCHASTIC SOLUTIONS OF THE AUTONOMOUS RECURRENCES OF THE SECOND ORDER QUELQUES EXEMPLES DE SOLUTIONS STOCHASTIQUES BORNEES DANS LES RECURRENCES AUTONOMES DU 2E ORDRE.
J. Bernussou, L. Hsu, and C. Mira. 1973, 17p
Conf-Presented at the Intern. Colloq. On Point Mapping and Its Appl., Toulouse, 10-14 Sep. 1973; Sponsored by the Lab. D'Autom. Et d'Anal. Des Systemes of the Cnrs.
In French; English Summary.

Descriptors: *Conformal mapping, *Iterative solution, *Recursive functions, *Stochastic processes, Computerized simulation, Conservation equations, Nonlinear equations, Perturbation theory, Real variables.

For abstract, see STAR 1206

N74-15314/9GA PC$3.00/MF$1.45
Academy of Sciences of the Ukranian SSR, Kiev (USSR). Inst. of Cybernetics.
STABILITY AND DISSIPATIVITY OF ONE CLASS OF NONLINEAR SAMPLED-DATA CONTROL SYSTEMS.
V. M. Kuntsevich, and V. V. Volosov. 1973, 12p
Conf-Presented at the Intern. Colloq. On Point Mapping and Its Appl., Toulouse, 10-14 Sep. 1973; Sponsored by the Lab. D'Autom. Et d'Anal. Des Systemes of the Cnrs.

Descriptors: *Command and control, *Data sampling, *Dissipation, *Nonlinear equations, *Stability, Control theory, Dynamic response, Lagrange multipliers, Liapunov functions, Pulse duration modulation.

For abstract, see STAR 1206

N74-15315/6GA PC$3.75/MF$1.45
Royal Aircraft Establishment, Farnborough (England). Aerodynamics Dept.
APPROXIMATE ANALYTIC METHODS FOR THE SOLUTION OF A CLASS OF STRONGLY NON-LINEAR DIFFERENTIAL EQUATIONS. A COMPARISON.
J. Ross, and P. A. T. Christopher. 1973, 34p ARC-R/M-3724, ARC-33861
Misc-Supersedes Arc-33861.

Descriptors: *Approximation, *Differential equations, *Nonlinear equations, Functions (Mathematics), Numerical integration, Problem solving.

For abstract, see STAR 1206

PB-228 460/2GA PC$4.50/MF$1.45
Maryland Univ., College Park. Computer Science Center.
A COMPARISON OF ALGORITHMS FOR THE EXACT SOLUTION OF LINEAR EQUATIONS.
Technical rept.,
Michael T. McClellan. Jan 74, 26p TR-290 NSF-OCA-GJ-35606-290
Grant NSF-GJ-35606

Descriptors: *Linear algebraic equations, *Computation, Computer programming, Chinese remainder theorem, Polynomials, Algorithms, FORTRAN.
Identifiers: UNIVAC 1108 computers, FORTRAN 4 programming language.

A computing time study of several algorithms for the exact solution of systems of linear equations with integer or polynomial coefficients is presented. The analytical computing times for rational gauss elimination, exact division elimination (one-step and two-step), and the modular algorithm are summarized and supplemented. Extensive empirical studies illustrate the superiority of the modular algorithm in agreements with the analytical results. All algorithms were programmed in FORTRAN 4 for the SAC-1 System and all cases were run on a UNIVAC 1108. (Author)

PB-228 652/4GA PC$6.50/MF$1.45
Cornell Univ., Ithaca, N.Y. Dept. of Computer Science.
A CONSTRUCTIVE THEORY OF RECURSIVE FUNCTIONS.
Technical rept.,
Robert L. Constable. Oct 73, 70p CU-CSD-73-186
Grant NSF-GJ-5979

Descriptors: *Recursive functions, *Computer programming, *Computation, Set theory, Trees(Mathematics), Theorems.
Identifiers: Predicate calculus.

Contents: A language with computational meaning; constructive basic recursive function theory; proofs and programs.

PB-229 343/9GA PC$4.00/MF$1.45
University of Southern California, Los Angeles. Dept. of Electrical Engineering.
UPPER AND LOWER BOUNDS FOR RANDOM WALK PROCESSES VIA INVARIANT IMBEDDING.
Technical rept.,
R. Bellman, and R. Vasudevan. Apr 73, 10p RB73-10, USC-113P19-45
Contract AT(04-3)-113, Grant NSF-GP-29049

Descriptors: *Fredholm equations, *Random walk, Probability theory, Matrices(Mathematics).
Identifiers: Invariant imbedding.

The classical version of one dimensional random walk problem leads to Fredholm integral equations. Bounds for the solution can be obtained by considering the physical process associated with the problem. In this paper a multistate random walk problem is considered. Upper and lower bounds for absorption probability elements relating to this process are obtained. (Author)

UCRL-51420(Rev.1) PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
SOLUTIONS OF THE SCALAR HELMHOLTZ EQUATION IN THE ELLIPTIC CYLINDER COORDINATE SYSTEM.
R. J. Lytle, and D. L. Lager. 15 Oct 73, 22p
Contract W-7405-eng-48

Descriptors: (*Helmholtz theorem, *Eigenvalues), (*Energy transfer, Helmholtz theorem), Coordinates, Eigenfunctions, Energy spectra, Mathematics, Scalars.

For abstract, see NSA 29 05, number 12432.

UCRL-51472 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
MODIFIED LU DECOMPOSITION ALGORITHM FOR A SYMMETRIC, TRIDIAGONAL MATRIX.
R. C. Y. Chin. 30 Oct 73, 6p
Contract W-7405-Eng-48

Descriptors: (*Algorithms, *Matrices), Interpolation, Mathematics.

For abstract, see NSA 29 05, number 12433.

UCRL-75004 PC$3.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
NUMERICAL IMAGE RESTORATION BY THE METHOD OF SINGULAR-VALUE DECOMPOSITION.
M. P. Ekstrom. 31 Oct 73, 5p CONF-740101-1

Descriptors: (*Images, *Numerical solution), Computers, Fredholm equation.

For abstract, see NSA 29 05, number 12434.

12B. Operations Research

AD-774 927/8GA PC$3.00/MF$1.45
Oregon Research Inst Eugene
WHO ACCEPTS SAVAGE'S AXIOM.
Technical rept.,
Paul Slovic, and Amos Tversky. Feb 74, 21p Rept no. Research Bull-Vol-14-2-74
Contract N00014-73-C-0438, ARPA Order-2449

Descriptors: *Decision theory, Mathematical logic, Probability.
Identifiers: Axioms, Utility theory, Gambling.

Many decision theorists believe that the axioms of rational choice are similar to the principles of logic in the sense that no reasonable person who understands them would wish to violate them. The present study questions this view by investigating the acceptability of a key axiom underlying expected utility theory--Savage's independence principle. Persistent violations of this axiom were observed, even after it was presented to subjects in a clear and, presumably compelling, fashion. The problem of distinguishing between rejection of a decision principle and failure to understand it is discussed. (Author)

AD-775 212/4GA PC$4.50/MF$1.45
Michigan Univ Ann Arbor Dept of Industrial and Operations Engineering
THE SUPERPOSITION OF TWO INDEPENDENT MARKOV RENEWAL PROCESSES,
W. Peter Cherry. 15 Sep 73, 29p
Contract N00014-67-A-0181-0047
Report on Queueing Network Research Project. Presented at the SIAMS-IMS 1973 Joint Fall Meeting, Iowa City, Iowa, 9 Oct 73. See also rept. dated 30 Dec 72, AD-755 234.

Descriptors: *Queueing theory, *Stochastic processes, Networks, Random variables, Distribution functions, Measure theory.
Identifiers: *Markov renewal processes, Markov chains.

In the paper the author investigates a problem arising in the theory of queueing networks, namely, the superposition of two independent Markov renewal processes defined on countable state spaces. It is shown by suitably defining random variables that the superposed process is a Markov renewal process defined on a state space which is essentially the cross product of a countable set with the non-negative real numbers. For the superposed process, the author obtains results dealing with recurrence properties of events, exhibits a stationary probability measure for the underlying Markov chain, and investigates the existence of a limit of the probability measure of the associated semi-Markov process. Finally, the author briefly discusses the implications of these results to the theory of queueing networks. (Modified author abstract)

AD-775 241/3GA PC$5.50/MF$1.45
Stanford Univ Calif Dept of Operations Research
LIMIT THEOREMS FOR CONTROLLED QUEUES.
Technical rept.,
John Howard Rath. 30 Oct 73, 176p Rept no. TR-41
Contract N00014-67-A-0112-0058, Grant NSF-GK-35491

Descriptors: *Queueing theory, Control theory, Stochastic processes, Convergence, Decision making, Costs, Theorems.
Identifiers: Limit theorems, Arrival time, Service time, Random walk.

The paper studies a class of controlled queues. In particular, the decision maker may choose one of two different servers to use. The objective is to minimize the expected average cost when there is a linear holding cost per unit time per customer, a different running cost per unit time for using each of the servers, and a switching cost incurred each time the server is switched. A functional limit theorem is proved for a sequence of random functions induced by a sequence of controlled queues, each of which is governed by a policy generated from a fixed set of switching points. The limit theorem holds when the traffic intensities for both servers are approaching one; that is, the sequence of queues is approaching a state of heavy traffic. (Modified author abstract)

AD-775 245/4GA PC$3.25/MF$1.45
Stanford Univ Calif Operations Research House
ON THE SOLUTION OF LARGE, STRUCTURED LINEAR COMPLEMENTARITY PROBLEMS. II.
Technical rept.,
Richard S. Sacher. Sep 73, 26p Rept no. TR-73-5
Contracts N00014-67-A-0112-0011, AT(04-3)-326
See also AD-764 581.

Descriptors: *Mathematical programming, Algorithms, Matrices(Mathematics), Data processing, Computations, Journal bearings, Mathematical models.
Identifiers: *Successive overrelaxation method, *Complementarity method, Pivot theory.

In an earlier paper, R. W. Cottle and the author proposed a special principal pivoting algorithm for a class of large, structured linear complementarity problems. The method was applied with encouraging results to data relating to the free boundary problem for infinite journal bearings. The purpose of the present paper is to compare the empirical performance of the principal pivoting method with that of two other pertinent methods. One of the latter employs LU factorizations and is adaptive in the sense that each iteration exploits the factorization associated with its predecessor. The other is a modification of the point successive overrelaxation technique. Recommendations based on the reported computational experience are made. (Author)

AD-775 279/3GA PC$3.25/MF$1.45
Naval Postgraduate School Monterey Calif
EVALUATION OF CERTAIN PROBABILITIES ASSOCIATED WITH A CLASS OF MARKOV CHAINS.
Technical rept.,
Bruno O. Shubert. Nov 73, 37p Rept no. NPS-55SY73111A

Descriptors: *Stochastic processes, *Recursive functions, Distribution functions, Matrices(Mathematics), Memory devices.
Identifiers: *Markov chains, Random walk, Finite state machines.

Two formulae are derived for ratios of limiting probabilities for a class of finite homogeneous Markov chains. The class consists of chains obtained by a generalization of Bernoulli random walk with reflecting or absorbing barriers. These chains are closely related to problems of testing hypotheses with finite memory. The formulae are recursive in nature and hence much easier to use than classical methods. (Author)

AD-775 335/3GA Reprint
Yale Univ New Haven Conn Cowles Foundation for Research in Economics
ON A CLASS OF EQUILIBRIUM CONDITIONS FOR MAJORITY RULE,
Gerald H. Kramer. Aug 71, 17p Rept no. Foundation Paper-397
Contract Nonr-3055(01)
Revision of report dated Feb 71.
Availability: Pub. in Econometrica, v41 n2 p285-297 Mar 73.

Descriptors: *Decision making, *Majorities, Mathematical models.
Identifiers: *Majority rule, Preferences, Utility functions.

The various conditions for non-intrasivity of majority rule formulated over the past decade have been concerned with choices over arbitrary, usually finite, sets of discrete alternatives. In many economic and other social choice problems, however, the possible choices constitute a point set in some appropriately defined multi-dimensional commodity or policy space. It is shown that in problems of this kind, when voter preferences can be represented by quasi-concave, differentiable utility functions, the various equilibrium conditions for majority rule are incompatible with even a very modest degree of heterogeneity of tastes, and for most purposes are probably not signifi-

cantly less restrictive than the extreme conditions of complete unanimity of individual preferences. (Author)

AD-775 462/5GA PC$4.75/MF$1.45
Massachusetts Inst of Tech Cambridge Operations Research Center
THE RESOLUTION OF DUALITY GAPS IN DISCRETE OPTIMIZATION.
Technical rept.,
David E. Bell. Aug 73, 128p Rept no. TR-81
AROD-9239.9-M
Contract DAHC04-73-C-0032

Descriptors: *Mathematical programming, *Optimization, Convex sets, Network flows, Algorithms.
Identifiers: Duality theory, Integer programming, Traveling salesman problem.

Methods by which the unconstrained group problem may be applied to generalized programming problems in which the activities are not known explicitly, are presented together with a worked example of the cutting stock problem. A special analysis is made of a generalized programming approach to the Traveling Salesman problem in which a different type of cut is presented. Two algorithms are given which resolve any duality gap for the general integer programming resulting from the unconstrained group problem. Both rely on an existing primal-dual ascent method of Fisher and Shapiro. Finally some theoretical considerations of the integer lattice are examined, particularly in connection with the intersection of corner polyhedra. (Author)

N74-15300/8GA PC$3.00/MF$1.45
Research Inst. of National Defence, Stockholm (Sweden).
ON THE EXISTENCE OF EQUILIBRIUM POINTS FOR CERTAIN N-PERSON GAMES.
T. Bjoerk. Oct 73, 4p FOA-P-B-8025-M3, ISBN-91-7056-024-2

Descriptors: *Approximation, *Game theory, Points (Mathematics), Strategy.

For abstract, see STAR 1206

13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

13A. Air Conditioning, Heating, Lighting, and Ventilating

AD-774 892/4GA PC$7.00/MF$1.45
National Bureau of Standards Boulder Colo Cryogenics Div
REFRIGERATION OF SUPERCONDUCTING ROTATING MACHINERY.
Interim rept. 14 Apr 72-30 Jun 73,
Vincent D. Arp. Jun 73, 76p Rept no. NBSIR-73-331

Descriptors: *Refrigeration systems, Cryogenics, Liquid helium, Equations of state, Equations, Flow, Superconductors, Machines, Hydrodynamics.

Recent work at the NBS Cryogenics Division in three areas related to helium refrigeration is summarized: (1) Analysis is given of a possible high pressure refrigeration cycle which offers in principle a reduced component size, but which turns out to be impractical because of expansion engine inefficiencies. (2) Exact equations for flow of a real fluid are derived and applied to problems of fluid flow near the critical point, as may occur with some helium-cooled superconducting systems, and (3) Three new equations of state for helium are given, each using different state variables, to eliminate the need for iterative techniques in helium refrigeration cycle and fluid flow analysis. (Author)

N74-15656/3GA PC$6.75/MF$1.45
AiResearch Mfg. Co., Los Angeles, Calif.
BRAYTON HEAT EXCHANGER UNIT DEVELOPMENT PROGRAM (ALTERNATE DESIGN).
Final Design Report.
J. D. Duncan, J. C. Gibson, R. F. Graves, C. J. Morse, and C. E. Richard. 2 Aug 73, 94p NASA-CR-121269, AIRESEARCH-73-9461
Contract NAS3-13454

Descriptors: *Brayton cycle, *Heat exchangers, *Structural design, Gas streams, Leakage, Optimization, Organic coolants, Parameterization.

For abstract, see STAR 1206

PATENT-2 983 810 Not available NTIS
Department of the Interior, Washington, D.C.
PHOTOFLASH UNIT.
Patent,
Robert S. James, and Joseph J. Seman. Filed 12 May 58, patented 9 May 61, 7p PAT-APPL-734 804, DOCKET/MIN-368
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Flash lamps, *Patents, Safety engineering, Explosionproofing, Enclosures.
Identifiers: PAT-CL-240-1-3.

The patent relates to a photoflash unit which is safe to use in areas likely to contain explosive gas or dust mixtures, such as coal mines, flour mills, chemical plants, etc. It provides a photoflash unit which will not operate unless all parts of the unit which may ignite an explosive atmosphere are enclosed in an explosion-proof case.

PATENT-3 321 009 Not available NTIS
Department of the Interior, Washington, D.C.
HIGH TEMPERATURE HEAT EXCHANGE USING LIQUID METAL.
Patent,
James P. McGee, and Neil H. Coates. Filed 1 Jun 65, patented 23 May 67, 3p PAT-APPL-460 605,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Heat exchangers, *Patents, Liquid metals, Heat transfer, Electromagnetic pumps.
Identifiers: PAT-CL-165-1.

The patent relates to high temperature exchange of thermal energy using an intermediate liquid metal exchange medium. In particular it relates to a heat exchange system wherein the heat source is maintained at a low pressure, such as ambient atmospheric pressure, and it is desired to transfer the energy to a process stream at a higher pressure.

PATENT-3 466 189 Not available NTIS
Department of the Interior, Washington, D.C.
METHOD FOR IMPROVING HEAT TRANSFER IN CONDENSERS.
Patent,
Robert A. Erb. Filed 2 Sep 66, patented 9 Sep 69, 3p PAT-APPL-577 092, DOCKET/SAL-903
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Condensers(Liquefiers), *Patents, Heat transfer, Plastic coatings, Polyphenyl hydrocarbons, Water vapor.
Identifiers: PAT-CL-117-132, Poly(Methylene-phenylene-methylene).

The patent relates to improved efficiency in the condensation of water vapor achieved through the use of para-xylylene polymer coatings as cooling surfaces.

PATENT-3 732 397 Not available NTIS
United Aircraft Corp., West Palm Beach, Fla.
INHERENT REDUNDANCY ELECTRIC HEATER.
Patent.
B. H. Kernodle. Patented 8 May 73, 4p NASA-CASE-MFS-21462-1,
Misc-Filed 30 Mar. 1972 Supersedes N72-22221 (10 - 13, p 1719). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Backups, *Electric power supplies, *Heaters, *Reliability engineering, Electrical engineering, *Patents, Redundant components, Wiring.

A cross-wound electrical heater comprising two resistance coils wound together with opposite pitches electrically connected at their crossing points, is reported. Each element is supplied by a separate power supply of the same magnitude, and each power supply is isolated from reverse currents by a diode. Failure of one of the windings results in only a moderate change in output power.

PATENT-3 745 785 Not available NTIS
Department of the Air Force Washington D C
SOLID CRYOGEN HEAT TRANSFER APPARATUS.
Patent,
Jimmie W. Crawford, and Ronald White. Filed 17 Jan 72, patented 17 Jul 73, 4p Rept nos. PAT-APPL-218 320,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. $0.50.

Descriptors: *Cryogenics, *Heat exchangers, *Patents, Cooling and ventilating equipment, Pressure, Valves.
Identifiers: PAT-CL-62-388.

The patent discloses an apparatus for transferring heat from a heat load to a solid cryogen having the solid cryogen in an insulated container. The solid cryogen has a plurality of gas passages therethrough. A gas circulator supplies sublimed gas from the passages in the solid cryogen to heat exchanger adjacent the heat load. A portion of the return gas is supplied to a heat exchanger for the gas circulator motor. The flow in the motor heat exchanger is controlled by the pressure of the gas in the return conduit from the load heat exchanger to the solid cryogen chamber and a pressure control valve connected in the output of the motor heat exchanger.

PB-227 815/8GA PC$3.75/MF$1.45
Cornell Univ., Ithaca, N.Y. Cornell Energy Project.
PROBLEMS OF AIR FLOW THROUGH LARGE NATURAL DRAFT COOLING TOWERS,
H. B. Zien. Apr 72, 74p Paper-72-15 NSF-RA/N-72-016
Grant NSF-GI-29903
Report on National Energy Needs and Environmental Quality.

Descriptors: *Cooling towers, *Air flow, Evaporative cooling, Electric power plants, Mathematical models, Heat transfer, Electric power generation.
Identifiers: Natural draft cooling towers.

The work deals with some problems that arise in the investigation of air flow through large natural draft cooling towers. In Chapter II a small perturbation analysis is employed to derive an equation relating tower diameter, temperature, heat transfer, and drag parameters. Good agreement between calculations using this result and values

from an actual tower installation indicates that the equation may be useful in tower design. In Chapter IV and Chapter V a free streamline model is used to simulate flow in the tower. One conclusion drawn from this analysis is that there are two regions in the tower which can be characterized by very different flows. Near the heat transfer surfaces the pressure drop effect dominates, and tower wall contour and drag distribution play an important role in the fluid dynamics. On the other hand, away from the heat transfer surfaces the buoyancy effect dominates, and tower wall contour and drag distribution are relatively unimportant. Assuming heat transfer surfaces to be situated in a horizontal configuration at the base of the tower, the proper boundary conditions are determined and the boundary problem defined. Then, the appropriate wall contour in the corner region is derived for varying drag coefficients of the heat transfer surface. (Author)

13B. Civil Engineering

AD-774 788/4GA PC$3.25/MF$1.45
Corps of Engineers Omaha Nebr Missouri River Div Lab
FIELD EVALUATION OF A POLYESTER RESIN ANCHOR SYSTEM FOR ROCKBOLTS.
Technical rept.,
Donn M. Foster. Mar 74, 30p Rept no. MRDL-1-74

Descriptors: *Bolts, *Rock mechanics, Supports, Polyester plastics, Anchors(Structural), Performance(Engineering), Loads(Forces), Stability, Loading(Handling), Stresses, Test methods, Test equipment, Installation, Construction.
Identifiers: *Rock bolts, *Anchor bolts.

The report covers the results of 18 field pull tests of polyester resin anchored rockbolts. Two sizes of rockbolts were included in the program along with point anchor, full-grouted-untensioned, and full-grouted-tensioned systems. Several of the installations were allowed to weather in outside exposure for one year prior to pull-out testing. The report concludes: (1) the installation is simple and relatively quick, requiring a minimum of men, equipment, and time; (2) the resin is sufficiently strong so that, in most cases, the integrity of the installation is dependent upon the strength of the rock or the bar relative to that of the resin and to the length of resin encapsulation; and (3) the integrity of the installation seems to be little affected by extended (in this case one-year) weathering. (Author)

AD-774 880/7GA PC$4.00/MF$1.45
Army Engineer Waterways Experiment Station Vicksburg Miss
CONCRETE ARMOR UNITS FOR PROTECTION AGAINST WAVE ATTACK; REPORT OF AD HOC COMMITTEE ON ARTIFICIAL ARMOR UNITS FOR COASTAL STRUCTURES.
Final rept.,
R. Y. Hudson. Jan 74, 90p Rept no. AEWES-Misc-Paper-H-74-2

Descriptors: *Breakwaters, *Construction materials, Coastal regions, Harbors, Ocean waves, Concrete, Fabrication, Casting, Geometric forms, Litigation.
Identifiers: *Shore protection, Design criteria.

A large number of special-shaped concrete armor units, for use in the protective cover layer of rubble-mound structures exposed to storm-wave action, have been developed throughout the world in the past 20 to 25 years. Quarrystone armor units may be used when available at a competitive price and when the wave conditions at the structure site are not too severe. The purpose of this report is to provide design information and guidance in selecting the shape and size of concrete armor units for use in constructing rubble-mound structures that will be stable at a minimum of cost. The factors that determine the choice of design waves are described; the development of a stability formula and stability coefficients for different amounts of damage to the structure are presented; the advantages of using high-density concrete in the fabrication of armor units are stressed; and the casting of armor units, the problems of breakage, and the legal aspects of using concrete armor units of special shape are discussed. (Modified author abstract)

AD-774 802/3GA PC$3.00/MF$1.45
Army Engineer Waterways Experiment Station Vicksburg Miss
SPILLWAY CREST DESIGN,
Thomas E. Murphy. Dec 73, 17p Rept no. AEWES-Misc-Paper-H-73-5

Descriptors: *Dams, Flow fluids.
Identifiers: *Spillways, Design criteria, Weirs.

The paper presents a method for design of the weir crest for any depth of approach or inclination of the upstream face of the spillway. (Author)

AD-774 898/1GA PC$3.00/MF$1.45
Naval Coastal Systems Lab Panama City Fla
HELICOPTER TOW TESTS OF THE U. S. COAST GUARD'S AIR DELIVERY CONTAINER FOR OIL SPILL CONTAINMENT BARRIER,
John R. Kennedy. Dec 73, 24p Rept no. NCSL-198-73

Descriptors: *Helicopters, *Containers, *Aerial delivery, Water pollution, Oil spills, Barriers, Towing, Towing cables, Aerial pickup systems, Flight testing, Oil pollution.
Identifiers: H-53 aircraft, *Oil pollution control.

An oil spill barrier with its air delivery packing container was successfully towed by a Navy H-53 tow-equipped helicopter. Flight tow tests were conducted to demonstrate feasibility, develop any required special equipment, and provide data for similar Coast Guard tests. (Author)

AD-775 345/2GA Reprint
Woods Hole Oceanographic Institution Mass
PETROLEUM HYDROCARBONS IN NARRAGANSETT BAY.
Technical rept.,
John W. Farrington, and James G. Quinn. 14 Nov 72, 13p Rept nos. WHOI-73-84, WHOI-Contrib-2880
Contract N00014-66-C-0241, Grant NSF-GA-19742
Prepared in cooperation with Rhode Island Univ., Kingston. Graduate School of Oceanography. Revision of report dated 20 Jun 72.
Availability: Pub. in Estuarine and Coastal Marine Science, v1 p71-79 1973.

Descriptors: *Hydrocarbons, *Oils, *Water pollution, Clams, Fuel oil, Sewage, Effluents, Rhode Island.
Identifiers: Oil spills, Oil pollution, *Narragansett Bay.

Analyses of hydrocarbons in surface sediments from eight stations and in clams (M. mercenaria) from three stations in Narranganset Bay show that both contain a very complex mixture of hydrocarbons which is not present in clams from Charlestown Pond, a relatively unpolluted coastal pond. This complex mixture of hydrocarbons is present in crude oils and fuel oils, and it is not a likely product of recent biosynthesis by marine organisms. This suggests that the sediments and clams from the areas sampled in Narranganset Bay are contaminated by petroleum hydrocarbons. Sewage effluents and small oil spills are the most probable sources of the petroleum hydrocarbons.

AD-775 366/8GA PC$4.00/MF$1.45
Air Force Weapons Lab Kirtland AFB N Mex
TREATABILITY OF AQUEOUS FILM-FORMING FOAMS USED FOR FIRE FIGHTING.
Final rept. Jun 72-Aug 73,
Ronald K. Kroop, and Joseph E. Martin. Feb 74, 94p Rept no. AFWL-TR-73-279

Descriptors: *Biodeterioration, *Fire extinguishing agents, Surface active substances, Fluorohydrocarbons, Foam, Activated sludge process, Activated carbon, Toxicity, Waste disposal, Tables(Data), Adsorption.
Identifiers: Trickling filtration, Performance evaluation.

The biodegradability of aqueous film-forming foams (AFFF) used for fire fighting was evaluated in laboratory-scale activated sludge and trickling filter reactors at the Air Force Weapons Laboratory. Three AFFFs were evaluated: 'Light Water' FC-200 from 3M Company Aerowater 3 percent from National Foam Company; and Aerowater 6 percent, also from National Foam Company. Concentrations not to exceed 100 mg/l of AFFF influent to the biological treatment process could be satisfactorily treated without affecting the performance of the process and with apparent detoxification of the AFFF. Adsoprtion of AFFFs onto activated carbon is practical. (Modified author abstract)

HW-80888(Del.) PC$6.75/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
EFFECTS OF HANFORD OPERATIONS ON COLUMBIA RIVER TEMPERATURES. INTERIM REPORT NO. 2.
J. P. Corley. 3 Dec 64, 93p

Descriptors: (*Hapo, Thermal effluents), (*Thermal effluents, *Temperature monitoring), (*Columbia river, Temperature monitoring), Liquid wastes, Reactor operation, Reactors, Thermal pollution, Waste disposal, Waste heat.

For abstract, see NSA 29 05, number 10165.

MHSMP-71-27 PC$3.50/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Amarillo, Tex. (Usa).
DISPOSAL OF WASTE OR EXCESS HIGH EXPLOSIVES. QUARTERLY PROGRESS REPORT, JANUARY--MARCH 1971.
F. I. Honea, and J. E. Wichman. 1971, 27p
Contract DA-11-173-AMC-487(A)

Descriptors: (*Chemical explosives, *Nonradioactive waste disposal), (*Nitrogen oxides, *Air pollution), Research programs.

For abstract, see NSA 29 05, number 12472.

N74-15335/4GA PC$3.00/MF$1.45
Kyoto Univ. (Japan).
USING WIND TUNNEL EXPERIMENTS TO FORECAST AUTOMOBILE EXHAUST GAS CONCENTRATIONS ALONG STREETS.
T. Odaira, K. Asakuno, S. Fukuoka, M. Udagawa, and S. Izumikawa. 1973, 20p APTIC-57002, TR-38A-74

Descriptors: *Air pollution, *Exhaust gases, *Wind tunnels, Atmospheric diffusion, Automobiles, Weather forecasting, Wind (Meteorology).

For abstract, see STAR 1206

N74-15336/2GA PC$3.00/MF$1.45
Tokyo Metropolitan Research Inst. for Environmental Protection (Japan).
DAMAGE TO VEGETATION WHEN EXPOSED TO OZONE AND HIGH OXIDANT CONCENTRATIONS.
Annual Report.
T. Odaira, T. Sawada, T. Komeiji, I. Nouchi, and K. Oguchi. 1973, 12p TR-38B-74

Descriptors: *Air pollution, *Ozone, *Plants (Botany), *Vegetation, Contaminants, Environment effects, Histology.

For abstract, see STAR 1206

N74-15347/9GA PC$5.50/MF$1.45
General Dynamics/Convair, San Diego, Calif. Aerospace Div.
AIR POLLUTION MEASUREMENTS FROM SATELLITES.
C. B. Ludwig, M. Griggs, W. Malkmus, and E. R. Bartle. Nov 73, 224p NASA-CR-2324, GDCA-HAB-73-011
Contract NAS1-10466

Descriptors: *Air pollution, *Remote sensors, *Satellite-borne instruments, Aerosols, Gas detectors, Raman spectra.

For abstract, see STAR 1206

N74-15354/5GA PC$3.50/MF$1.45
Stockholm Univ. (Sweden). Inst. of Meteorology.
RESIDENCE TIME OF ATMOSPHERIC POLLUTANTS AS DEPENDENT ON SOURCE CHARACTERISTICS, ATMOSPHERIC DIFFUSION PROCESSES AND SINK MECHANISMS.
B. Bolin, G. Aspling, and C. Persson. May 73, 29p AC-25

Descriptors: *Air pollution, *Atmospheric diffusion, *Sinks, Atmospheric circulation, Atmospheric turbulence, Rain.

For abstract, see STAR 1206

N74-15659/7GA PC$2.75/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EFFECT OF INCREASED FUEL TEMPERATURE ON EMISSIONS OF OXIDES OF NITROGEN FROM A GAS TURBINE COMBUSTOR BURNING ASTM JET-A FUEL.
N. R. Marchionna. Jan 74, 18p NASA-TM-X-2931, E-7634

Descriptors: *Air pollution, *Exhaust gases, *Gas turbines, *Jet engine fuels, *Nitrogen oxides, Emission, Endothermic fuels, Fuel combustion, Fuel tests, Temperature effects.

For abstract, see STAR 1206

N74-15669/6GA PC$3.75/MF$1.45
RAND Corp., Santa Monica, Calif.
TRANSPORT IMPROVEMENT, COMMUTING COSTS, AND RESIDENTIAL LOCATION.
J. P. Stucker. May 73, 33p P-4983

Descriptors: *Air transportation, *Cost analysis, *Position (Location), *Urban transportation, California, Improvement, Land use.

For abstract, see STAR 1206

PATENT-3 028 183 Not available NTIS
Department of the Interior, Washington, D.C.
SEALED BALL JOINT FOR ELECTRODES.
Patent,
Werner A. Phillips. Filed 30 Nov 59, patented 3 Apr 62, 3p PAT-APPL-856 317, DOCKET/MIN-388
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Ball joints, *Patents, Electrodes, Vacuum seals, Vacuum furnaces.
Identifiers: PAT-CL-287-87.

The patent relates to improved ball joints for rod or shaft members extending through a wall section, whereby the rods may be moved axially and from side to side on one side of the wall by manipulating the rod portion extending through on the other side. The embodiment is adapted for providing a vaccum-tight joint for water cooled electrodes in a vacuum arc melting furnace.

PATENT-3 385 786 Not available NTIS
Department of the Interior, Washington, D.C.
SYSTEM FOR BIOLOGICAL TREATMENT OF SEWAGE.
Patent,
John W. Klock. Filed 28 Oct 66, patented 28 May 68, 8p PAT-APPL-591 053,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Sewage treatment, *Serpentine, Aerobic processes.
Identifiers: PAT-CL-210-12.

This invention relates to the reclamation of sewage by biological treatment. Sewage is first passed through a serpentine path for anaerobic digestion, and then through a serpentine trough floating on the sewage in the anaerobic digestion zone. In the floating trough the sewage is exposed to light and aerobic digestion to promote the growth of algae.

PATENT-3 480 144 Not available NTIS
Department of the Interior, Washington, D.C.
PROCESS FOR REMOVING PHOSPHORUS FROM WASTE WATER.
Patent,
Edwin F. Barth, and Morris B. Ettinger. Filed 3 May 68, patented 25 Nov 69, 4p PAT-APPL-726 285, DOCKET/FWP-1181
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Sewage treatment, *Phosphorus, *Activated sludge process, Chemical removal(Sewage treatment), Precipitation(Chemistry), Aeration.
Identifiers: PAT-CL-210-4.

The patent describes a process in which phosphates are removed from sewage streams treated by the activated sludge process by introducing phosphate precipitating ions directly into the aerating zone of the process.

PB-227 468/6GA PC$3.25/MF$1.45
Highway Research Board, Washington, D.C. Committee on Transportation Research Information Systems.
ACTION PLAN FOR A NATIONAL NETWORK OF TRANSPORTATION RESEARCH INFORMATION SERVICES (TRISNET).
Final rept. Jan-Jun 73.
Dec 73, 48p*
Contract DOT-OS-00035
See also report dated Nov 72, PB-214 004.

Descriptors: *Information systems, *Transportation, Information retrieval, Traffic engineering, Networks.
Identifiers: *Management information systems, Information services.

This report of the TRIS Committee contains thirty-sight recommendations and seven inplementation tasks for the development of a national network of transportation research information services. The recommendations cover user requirements, a subsystem for project resumes and document abstracts, a subsystem for document access, network coordination, and financial support for the network. Implementation tasks indlude a coordinating unit for the network, user conferences, market research and publicity, on-line acress, a document access subsystem, development of new services, and service directories.

PB-227 715/0GA PC$15.25/MF$1.45
Stanford Univ., Calif. Dept. of Industrial Engineering.
SOLUTION ALGORITHMS FOR RESOURCE AND ROUTE CONSTRAINED SHORTEST PATH PROBLEMS IN TIME-DEPENDENT TRANSPORTATION NETWORKS.
Research rept.,
Erkut Yucaoglu. Jul 73, 245p RR-4 UMTA-CA-11-0008-73-7

Descriptors: *Transportation models, *Network flows, *Urban transportation, Graph theory, Dynamic programming, Routing, Scheduling, Computation, Algorithms.
Identifiers: *Shortest path method, Branch and bound method.

Several problems within the class of deterministic linear network optimization problems have been formulated and solved. They can be described as constrained shortest path problems which occur in transportation networks. The constraints involve specified route, resource, and schedule restrictions. The network represents a single mode configuration of transportation routes, and consists of a given set of nodes and directed arcs. The mathematical formulations of four related problems are given. The first shortest path problem is constrained only by schedule restrictions. The second problem has an additional resource constraint. Each of these two problems is then complicated by the addition of route constraints to form two other problems. Two different cases for each of the last two problems are formulated. A survey of available programming techniques and their extentions for the above problems is presented. (Modified author abstract)

PB-227 823/2GA PC$4.00/MF$1.45
Cornell Univ., Ithaca, N.Y. Cornell Energy Project.
REVIEW OF TECHNOLOGY FOR THE CONTROL OF EMISSIONS FROM FOSSIL FUELED ELECTRIC POWER STATIONS,
C. R. Aleta, and F. C. Gouldin. Aug 72, 98p*
Paper-72-21 NSF-RA/N-72-022
Grant NSF-GI-29903

Descriptors: *Air pollution control equipment, *Electric power plants, *Combustion products, Particles, Sulfur dioxide, Nitrogen oxides, Reviews, Electrostatic precipitators, Coal gasification, Fluidized bed processors, Cost estimates.
Identifiers: *Air pollution control, Technology assessment.

Technologies and strategies for reducing emissions of SOx, NOx, and particulates from fossil fired central power stations are reviewed. The review is based on an extensive literature survey, questionnaires sent to power companies and suppliers, interviews with technical and managerial personnel involved with emission control, and our own technical evaluation of the situation. Consideration is given separately to available, soon to be available, and future technologies for control of these air pollutants. Available options include low sulfur fuels, electrostatic precipitators, tall stacks, nuclear power, and combustion modifications. Soon to be available technologies consist mainly of the various SOx gas cleaning systems and fluidized bed boilers; while future technologies involve combined cycles, coal gasification to low or high BTU gas, and a coal cleaning process for removing sulfur and ash. Where possible, cost estimates and efficiency rating for the various systems are preserved. (Author)

PB-227 965/1GA PC$3.75/MF$1.45
California State Div. of Highways, Sacramento. Transportation Lab.
SUBAUDIBLE ROCK NOISE (SARN) AS A MEASURE OF SLOPE STABILITY.
Final rept.,
Ronald Mearns, and Thomas Hoover. Aug 73, 62p* CA-DOT-TL-2537-1-73-24

Descriptors: *Highways, *Slopes, *Acoustic measurement, Stability, Rock mechanics, Landslides, Soil stabilization, Acoustic detectors, California.
Identifiers: SARN(Subaudible Rock Noise), *Subaudible rock noise, *Slope stability.

A technique for using subaudible rock noise (SARN) to measure slope stability has been

developed by the California Division of Highways. The technique and the equipment used are described and instructions for their application are presented. Several case histories are described to illustrate some of the types of problems to which SARN monitoring can be applied. The Division is planning to perform SARN monitoring as a routine method for stability evaluation and is assembling the necessary equipment.

PB-228 058/1GA PC-GPO/MF$1.45-NTIS
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
TREATMENT OF HAZARDOUS MATERIAL SPILLS WITH FLOATING MASS TRANSFER MEDIA.
Basil W. Mercer, Alan J. Shuckrow, and Gaynor W. Dawson. Sep 73, 96p W74-04043, EPA-670/2-73-078
Contract EPA-68-01-0124
Paper copy available from GPO $1.25 as EP1.23:670/2-73-078.

Descriptors: *Water pollution, *Hazardous materials, Activated carbon treatment, Ion exchanging, Oils, Adsorption.
Identifiers: *Water pollution control.

An approach for the in situ treatment of spills of soluble hazardous polluting substances was developed and demonstrated on a field scale for a static body of water. Laboratory scale experimentation showed that floating sorbents and ion exchange resins could be highly effective removal agents when applied as small particles beneath the surface of contaminated waters. (Modified author abstract)

PB-228 118/6GA PC$13.25/MF$1.45
Texas Instruments, Inc., Dallas.
BIOLOGICAL ASSESSMENT OF DIESEL SPILL IN THE VICINITY OF ANACORTES, WASHINGTON, MAY 1971.
Final rept.,
J. A. Watson, J. P. Smith, and L. C. Ehrsam. 31 Aug 71, 201p
Contract EPA-68-01-0017

Descriptors: *Water pollution, *Biological surveys, Coasts, San Juan Islands, Benthos, Littoral zone, Diesel fuels, Sediments, Chemical analysis, Aquatic animals, Mortality.
Identifiers: *Anacortes(Washington), *Oil pollution, Oil spills, Water pollution effects(Animals), Species diversity.

A survey to assess the biological damage resulting from the 26 April 1971 diesel spill at Anacortes, Washington, was conducted between 9 May and 12 May 1971. Analyses of samples of hydrocarbon content using gas chromatography clearly indicate diesel contamination of sediments and water in the high-impact areas. The evidences for environmental damage are both visual (oozing of oil from intertidal sediments) as revealed by photographs and verban documentation and circumstantial as revealed by the detailed analysis of the faunal data collected during this study. Diversity indices illustrated that the lowest diversities were obtained from the areas of largest visible amounts of oil.

PB-228 146/7GA PC$3.25/MF$1.45
Utah Center for Water Resources Research, Logan.
SOCIAL, ECONOMIC, ENVIRONMENTAL, AND TECHNICAL FACTORS INFLUENCING WATER REUSE.
Project completion rept. 1 Jul 72-30 Jun 73,
A. Bruce Bishop, Sumvuth Pratishthanada, John Keith, Craig Colton, and A. Berry Crawford. Dec 73, 44p* PRJER025-1 W74-04317, OWRR-A-016-UTAH(1)
Contract DI-14-31-0001-3845

Descriptors: *Water pollution abatement, *Waste water, *Water reclamation, *Water supply, Water quality, Water treatment, Network flows, Social change, Litigation, Economic factors, Environmental surveys, Management engineering.

The potential for wastewater salvage and reuse in a region is described in terms of the systems relations among the social and economic parameters affecting reuse of water and the environmental and technological aspects of wastewater disposal or salvage. Components of the hydrologic system are abstracted in network flow diagram which shows the water supply sources that are influent to water using activities (municipal, industrial, agricultural, fish and wildlife, and recreation) and the discharge of effluents from these activities. This framework is used to identify mechanisms--technological, economic, social, legal, and environmental--that will control or influence water reuse. (Modified author abstract)

PB-228 148/3GA PC$7.50/MF$1.45
Environmental Protection Agency, Cincinnati, Ohio. Office of Water Program Operations.
BIOLOGICAL TREATMENT TECHNOLOGY (162).
Final rept.,
F. J. Ludzack. Dec 73, 326p* EPA-430/1-73-017

Descriptors: *Sewage treatment, *Manuals, Activated sludge process, Nutrients, Biochemical oxygen demand, Trickling filtration, Chlorination, Sludge disposal.

This manual includes a collection of instructional materials to assist the student to upgrade performance of biological treatment facilities. Information gathering techniques related to wastewater characteristics, concentrations, and loading are described. The influence of these data upon common treatment operations and correction of treatability difficulties are considered. Operational control to maximize the performance of existing facilities are discussed along with selection of add-on operations or design of new facilities to upgrade the treatment system to a performance compliance status.

PB-228 183/8GA PC$7.25/MF$1.45
Texas Univ., Austin. Div. of Natural Resources and Environment.
ESTABLISHMENT OF OPERATIONAL GUIDELINES FOR TEXAS COASTAL ZONE MANAGEMENT.
Interim rept. summary,
E. Gus Fruh. May 73, 85p NSF-RA/E-73-008
Grant NSF-GI-34870

Descriptors: *Texas, *Coasts, Management planning, Methodology, Land use, Water pollution, Legislation, Estuaries, Economics.
Identifiers: *Coastal zone management.

The overall goal of this two-year interdisciplinary research project is the development and evaluation of a proposed methodology for effective management of the Texas Coastal Zone. This interim report summarizes the work concluded during the first year of the study. The first objective of the past year was the development of a systematic approach by which various proposed coastal zone management policies could be evaluated in terms of their economic and environmental impact. The second purpose was the establishment of operating criteria by which economic and environmental impact could be assessed. (Modified author abstract)

PB-228 325/7GA PC$12.25/MF$1.45
Center for the Environment and Man, Inc., Hartford, Conn.
TESTS OF AN URBAN METEOROLOGICAL-POLLUTANT MODEL USING CO VALIDATION DATA IN THE LOS ANGELES METROPOLITAN AREA. VOLUME I.
Final rept. Sep 71-Feb 73,
Joseph P. Pandolfo, and Clifford A. Jacobs. May 73, 184p CEM-490-A-Vol-1 EPA-R4-73-025a
Contract EPA-68-02-0223
See also PB-228 326.

Descriptors: *Air pollution, *Atmospheric circulation, *Computerized simulation, Mathematical models, Tests, Boundary layer, Carbon monoxide.
Identifiers: Los Angeles(California), Path of pollutants.

The urban boundary-layer model has been tested with data from Los Angeles, California. The tests were intended to estimate the degree to which observed spatial and temporal variations of meteorological conditions and concentrations of a stable air pollutant could be realistically simulated by the model.

PB-228 326/5GA PC$10.50/MF$1.45
Center for the Environment and Man, Inc., Hartford, Conn.
TESTS OF AN URBAN METEOROLOGICAL-POLLUTANT MODEL USING CO VALIDATION DATA IN THE LOS ANGELES METROPOLITAN AREA. VOLUME II. FORTRAN PROGRAM AND INPUT/OUTPUT SPECIFICATION.
Final rept. Sep 71-Feb 73,
Joseph P. Pandolfo, and Clifford A. Jacobs. May 73, 146p CEM-490-A-Vol-2 EPA-R4-73-025b
Contract EPA-68-02-0223
See also PB-228 325.

Descriptors: *Air pollution, *Atmospheric circulation, *Computerized simulation, Computer programs, FORTRAN.

Input deck make-up and FORTRAN IV listings are presented for the numerical model described in Volume I. (Author)

PB-228 329/9GA PC$19.50/MF$1.45
Arizona State Highway Dept., Phoenix. Research Div.
AN INVESTIGATION OF THE LOAD CARRYING CAPACITY OF DRILLED CAST-IN-PLACE CONCRETE PILES BEARING ON COARSE GRANULAR SOILS AND CEMENTED ALLUVIAL FAN DEPOSITS.
Final rept. Sep 70-Feb 73,
George H. Beckwith, and Dale V. Bedenkop. May 73, 330p AHD-RD-10-122
Prepared by Sergent, Hauskins and Beckwith, Consulting Soil and Foundation Engineers, Phoenix, Ariz.

Descriptors: *Concrete piles, *Bearing capacity, Loads(Forces), Pile foundations, Soil mechanics, Penetration resistance, Bearing tests, Arizona.

Seven load tests of drilled piles were performed on coarse granular soils and 20 tests on cemented alluvial fan deposits. Maximum test load was 1000 tons. Detailed site selection and site soil investigation studies were performed. A special trailer-mounted portable load frame was designed and fabricated for the project. Belled, straight, small multiple bell, end-bearing only and side shear only tests were performed. A tell-tale instrumentation was used. A comparison of various settlement analysis and bearing capacity calculation methods was made. Calculations for the finer-grained cemented alluvial fan soils were based upon consolidation, direct shear and field pressuremeter and penetration tests. Design recommendations and construction procedures are presented.

PB-228 330/7GA PC$3.75/MF$1.45
Connecticut Univ., Storrs. Dept. of Civil Engineering.
APPLICATION OF ELECTRO-OSMOSIS TO MARGINAL SOILS.
Final rept.,
Richard P. Long, and Thomas F. Zimmie. Mar 73, 59p JHR-73-62

Descriptors: *Electroosmosis, *Saturated soils, *Soil stabilization, Glacial till, Clay soils, Consolidation, Tests, Porosity.

An investigation of the application of electroosmosis to marginal soils was undertaken. The experimental program involved laboratory as well as field measurements. Two types of marginal soil, both occurring in Connecticut, varved clay and glacial till, were used in the experiments. In highway construction, however, glacial till is not always considered marginal. In addition, the properties and electro-osmotic behavior of stratified deposits were studied using combinations of fritted glass disks having different pore sizes. (Modified author abstract)

PB-228 346/3GA PC$7.25/MF$1.45
Voorhees (Alan M.) and Associates, Inc., Denver, Colo.
WASATCH FRONT REGIONAL TRANSIT DEVELOPMENT PROGRAM.
Final rept.
Mar 73, 304p UMTA-UT-09-0003-73-1

Descriptors: *Mass transportation, *Utah, *Bus lines, *Regional planning, Management methods, Surveys, Performance evaluation, Services, Public administration, Routing, Maintenance, Facilities, Consumers.
Identifiers: Fare structures, Alternatives, Counties.

The purpose of the study is to first evaluate the present local service provided in parts of Box Elder, Weber, Davis, Salt Lake and Tooele Counties, Utah, by private bus companies, and then to determine the alternatives for improving service including the possible public acquisition of these private companies. Second is the development of a short-range program for improving transit service in the study area and integration of the improved program with the operations of the Utah Transit Authority (UTA). Present transit service is analyzed in terms of such factors as route characteristics, fares, equipment, management, maintenance and facilities, patronage and user characteristics, trip purpose and travel patterns. Transit service alternatives are examined; recommendations are proposed.

PB-228 384/4GA PC$4.25/MF$1.45
Environmental Protection Agency, Washington, D.C. Mobile Source Pollution Control Program.
FUEL ECONOMY AND EMISSION CONTROL.
Nov 72, 24p

Descriptors: *Automotive engineering, *Fuel consumption, *Exhaust emissions, *Air pollution control equipment, Automobiles, Statistical analysis, Compression ratio, Trends, Rotary combustion engines, Diesel engines.

This paper analyzes the effect on fuel economy of emission controls on autombiles. The analysis examines the various vehicle design factors, including emission control devices, which affect motor vehicle fuel economy and discusses the impact of the individual variables. Fuel penalties which may be associated with emission control systems are placed into the perspective of other fuel penalties which are currently, or may in the future, be experienced by the motoring public.

PB-228 440/4GA PC$18.50/MF$1.45
JBF Scientific Corp., Burlington, Mass.
A COMPUTER MODEL FOR EVALUATING COMMUNITY PHOSPHORUS REMOVAL STRATEGIES,
Donald S. Yeaple, David A. Barnes, and Francis A. DiGiano. Oct 73, 310p EPA-400/9-73-001
Contract EPA-68-01-0758

Descriptors: *Chemical removal(Sewage treatment), *Phosphorus, Strategies, Substitutes, Cost estimates, Computer programs, Legislation, Detergents, Precipitation(Chemistry), Alums, Ion exchanging, Decision making, Management planning.
Identifiers: Physical chemical treatment, Tertiary sewage treatment.

A computer model for evaluating a number of strategies for removing phosphorus in wastewater has been developed. The influence on total treatment cost of several non-treatment strategies such as the elimination of phosphates in detergents can be evaluated in terms of the treatment cost at local waste treatment plants. A review of phosphorus removal technology was conducted in order to determine what methods should be included as available techniques in a treatment strategy. Chemical precipitation techniques were selected as being both available and most effective at the present time and in the immediate future. (Modified author abstract)

PB-228 441/2GA PC$3.00/MF$1.45
Environmental Protection Agency, Washington, D.C. Library Systems Branch.
SUMMARIES OF FOREIGN GOVERNMENT ENVIRONMENTAL REPORTS.
Foreign documents announcements.
Oct 72, 24p* EPA/FDA-2

Descriptors: *Pollution, *Documents, Air pollution, Water pollution, Pesticides, Radiation, Foreign governments, Abstracts, Solid waste disposal, Japan, Sweden, Denmark, Czechoslovakia, East Germany, Hungary, France, Italy, USSR, West Germany, Norway.
Identifiers: Noise pollution.

Under a series of documents exchange agreements with environmental agencies in other countries, EPA is building a collection of environmental reports issued by foreign governments and international organizations. This is the second in a series of announcements of foreign documents received. The series is devoted to summaries of government reports and concentrates on the legislative, economic and social aspects of environmental pollution.

PB-228 442/0GA PC$3.25/MF$1.45
Environmental Protection Agency, Washington, D.C. Library Systems Branch.
SUMMARIES OF FOREIGN GOVERNMENT ENVIRONMENTAL REPORTS.
Foreign documents announcements.
Nov 72, 29p* EPA/FDA-3

Descriptors: *Pollution, *Documents, Air pollution, Water pollution, Pesticides, Radiation, Solid waste disposal Foreign governments, Abstracts, Czechoslovakia, East Germany, France, Italy, Japan, Poland, West Germany, USSR, Switzerland.
Identifiers: Nosie pollution.

Under a series of documents exchange agreements with environmental agencies in other countries, EPA is building a collection of environmental reports issued by foreign governments and international organizations. This is the third in a series of announcements of foreign documents received. The series is devoted to summaries of government reports and concentrates on the legislative, economic and social aspects of environmental pollution.

PB-228 447/9GA PC$14.75/MF$1.45
Tennessee Valley Authority, Chattanooga.
FULL-SCALE DESULFURIZATION OF STACK GAS BY DRY LIMESTONE INJECTION. VOLUME I.
Final rept.,
F. E. Gartrell. Aug 73, 232p EPA-650/2-73-019a

Descriptors: *Air pollution control, *Sulfur dioxide, *Boilers, *Desulfurization, Flue gases, Electric power plants, Coal, Performance evaluation, Cost estimates, Calcium oxides.
Identifiers: *Limestone injection, Dry methods.

The report gives results of a test program of dry limestone injection, demonstrated on a 150-Mw pulverized-coal-fired boiler at TVA's Shawnee Plant. The program included: equipment shakedown, dust distribution studies, process optimization, and long-term injection trails. It identified major process variables; evaluated distribution of lime dust in the boiler, effect of operating variables on distribution, and resulting effects on SO2 removal; evaluated the sensitivity of SO2 removal to key operating and process variables; evaluated conditions for optimum SO2 removal; studied process effects on boiler operation and maintenance, on solids collection equipment, and on water quality; and completed a process economics study. The program is discussed in context with previous investigations and EPA-sponsored support activities. Appendices contain test program detail results and results of EPA support projects. Because of low SO2 removal efficiencies and the potential for major reliability problems, it does not appear that dry limestone injection will play an important role in controlling SO2 emissions from power plants.

PB-228 448/7GA PC$5.25/MF$1.45
Rou (C.M.) Forest Products Services, Inc., Mobile, Ala.
DETERMINATION OF THE FEASIBILITY OF USING SOUTHERN PINE VENEER LOG CORES AS POSTS FOR FENCING HIGHWAY PROJECTS.
Final rept. Jun 72-May 73,
Charles M. Rou. May 73, 45p

Descriptors: *Highways, *Fences, *Wooden logs, Georgia, Pine wood, Evaluation, Deterioration, Transportation, Maintenance.

The study was conducted for the Department of Transportation of Georgia to evaluate Southern pine veneer log cores used for highway fencing. Objectives included to: Determine serviceability, residual preservative retention and penetration of posts 3 to 7 years old; study effects of caps in preventing post top deterioration from ewathering and decay; determine effects of air seasoning on checking, preservative retention and penetration compared with steam-vacuum conditioning; and to provide recommendations for future use of posts and caps, and specification changes.

PB-228 456/0GA PC$4.50/MF$1.45
Sydney Univ., (Australia). Civil Engineering Labs.
THE CONSOLIDATION OF A FINITE LAYER SUBJECT TO SURFACE LOADING.
Research rept.,
J. R.Booker. Aug 73, 27p R-223

Descriptors: *Clay soils, *Consolidation, Settlement(Structural), Numerical analysis, Soil mechanics, Australia.

In this paper a solution to the problem of the consolidation of a clay layer resting on a rough rigid base and subject to general surface loading is given. The solution is evaluated for the particular cases of a uniformly loaded strip, circle and square for a variety of Poisson's ratio's. The results are compared with previous solutions which have used the less realistic assumption that the clay layer rests on a smooth rigid base.

PB-228 511/2GA PC$7.75/MF$1.45
California State Div. of Highways, Sacramento. Equipment Branch.
TUNNEL CLEANING METHOD.
Final rept.,
Robert W. Apperson. 30 Jun 73, 95p CA-HY-7107-1-73-01

Descriptors: *Tunnels, *Washing, Cleaning, Soaps, Vehicles, Hydraulic valves, Highways, Transportation, Maintenance.

A method has been devised to scrub tunnel surfaces clean by using rotating brushes, water and tunnel washing soap. Proportional Electro-hydraulic Control Valves provide accurate controls for the operator to position boom mounted brush heads on the tunnel surfaces. The four axle, 48,000

GVW carrier vehicle transports 1,000 gallons of water, 700 gallons of soap, operator and driver cabs, as well as all hydraulic components needed to accomplish the task of tunnel washing. Since the speed of operation is related to the amount of contaminant deposited and the surface condition of the tunnel, the effective forward travel speed of the washer varies up to a top speed of 143 ft/min.

PB-228 524/5GA PC$3.25/MF$1.45
Illinois Inst. for Environmental Quality, Chicago.
FEASIBILITY OF OZONE DISINFECTION OF SECONDARY EFFLUENT.
Final rept.,
Elaine Greening. Jan 74, 48p IIEQ-74-3

Descriptors: *Effluents, *Ozonization, *Microorganism control(Sewage treatment), Chlorination, Evaluation, Pilot plants, Data, Illinois.
Identifiers: Water pollution control.

This study is concerned with the use of ozone in treating secondary wastewater effluents. The main advantage in using ozone rather than chlorine for secondary disinfection is in the removal of viruses; ozone has been shown to be a more effective viricide than chlorine. Higher levels of ozone than might have been expected were required for disinfection and reduction of the parameters measured in the study. Also, ozone-iron induced flotation was not as efficient as expected. On the basis of this study, ozone was not recommended for disinfection of secondary treated effluents in Illinois.

PB-228 561/7GA MF$1.45-NTIS
Milwaukee Sewerage Commission, Wis.
200 MGD ACTIVATED SLUDGE PLANT REMOVES PHOSPHORUS BY PICKLE LIQUOR.
Environmental Protection technology series rept.,
Raymond D. Leary, Lawrence A. Ernest, Roland S. Powell, and Richard M. Manthe. Sep 73, 137p EPA-670/2-73-050, W74-04554
Paper copy available GPO $1.50 as EP1.23:670/2-73-050.

Descriptors: *Chemical removal(Sewage treatment), *Phosphorus, *Sewage treatment, Pickling compositions, Iron sulfate, Precipitation(Chemistry), Activated sludge process.
Identifiers: Milwaukee(Wisconsin), Physical chemical treatment.

The Milwaukee Sewerage Commission's Jones Island Waste Water Treatment Plant consists of a mutual primary treatment facility followed by two separate activated sludge plants. To enhance phosphorus removal in the 115 MGD East Plant, hot spent sulfuric acid pickle liquor (ferrous sulfate) was added for a one year test period in 1970 while the 85 MGD West Plant was operated as a control. This follow up report covers the 1971 operational period in detail and the first four months in 1972. (Modified author abstract)

PB-228 563/3GA PC$7.50/MF$1.45
Wyle Labs., El Segundo, Calif.
A PROGRAM FOR THE MEASUREMENT OF ENVIRONMENTAL NOISE IN THE COMMUNITY AND ITS ASSOCIATED HUMAN RESPONSE. VOLUME I. A FEASIBILITY TEST OF MEASUREMENT TECHNIQUES.
Final rept. Jul 72-Dec 73,
Louis C. Sutherland, Marcia H. Braden, and Richard Colman. Dec 73, 329p* WR-73-8-Vol-1 DOT-TST-74-5
Contract DOT-OS-20223
See also Volume 2, PB-228 564.

Descriptors: *Noise pollution, *Measurement, *Transportation, Exposure(Physiology), Urban areas, Surveys, Hearing, Feasibility.

The report presents the results of a pilot test of the measurement techniques of transportation noise, suitable for execution on a national scale. The goal of the program has been the development or validation of measurement techniques (physical or subjective) which could be employed to establish a baseline of the noise exposure for communities and for individuals in their everyday activity and to develop an optimum descriptor for noise applicable to the baseline data and/or utilized subsequently for noise regulations, noise monitoring or noise control. (Modified author abstract)

PB-228 564/1GA PC$5.50/MF$1.45
Wyle Labs., El Segundo, Calif.
A PROGRAM FOR THE MEASUREMENT OF ENVIRONMENTAL NOISE IN THE COMMUNITY AND ITS ASSOCIATED HUMAN RESPONSE. VOLUME II. A PLAN FOR A NATIONAL PROGRAM.
Final rept. Jul 72-Dec 73,
Louis C. Sutherland, Marcia H. Braden, and Richard Colman. Dec 73, 200p* WR-73-8-Vol-2 DOT-TST-74-6
Contract DOT-OS-20223
See also Volume 1, PB-228 563.

Descriptors: *Noise pollution, *Measurement, *Transportation, Exposure(Physiology), Urban areas, Surveys, Hearing, Monitors.

This is the second of a two-volume report on measurement and evaluation of environmental noise exposure for communities and individuals. The volume is concerned with the presentation of detailed plans to accomplish the following tasks: (1) Conduct a baseline measurement program at the national level to establish the current magnitude of noise exposure for residential communities and for individuals in their everyday activity; (2) Develop a noise descriptor scale; (3) Define potential participation of local governments in the baseline data acquisition; (4) Develop a specification for noise monitoring systems suitable for permanent installation in communities as part of local or national environmental monitoring systems. (Modified author abstract)

PB-228 565/8GA PC-GPO/MF$1.45-NTIS
Colorado State Univ., Fort Collins.
LIME DISINFECTION OF SEWAGE BACTERIA AT LOW TEMPERATURE.
Environmental Protection technology series,
S. M. Morrison, K. L. Martin, and D. E. Humble. Sep 73, 102p EPA-660/2-73-017, W74-04548
Paper copy available from GPO $1.25 as stock no. EP1.23;660/2-73-017.

Descriptors: *Microorganism control (Sewage treatment), *Calcium oxides, Nutrients, Coliform bacteria, Low temperature tests, pH, Chemical removal(Sewage treatment), Biochemical oxygen demand, Disinfection, Arctic regions.

Small isolated communities in cold climatic areas need a simple, inexpensive, reliable sewage system which includes disinfection. This laboratory study provides clarifying data on the action of lime as a sewage disinfectant at low temperatures. Nutrient level reductions were also studied. (Modified author abstract)

PB-228 572/4GA PC$6.00/MF$1.45
New York State Dept. of Transportation, Albany. Engineering Research and Development Bureau.
CONSTRUCTION CONTROL OF RIGID PAVEMENT ROUGHNESS.
Final rept.,
James E. Bryden, and Robert W. Rider. Nov 73, 57p NYSDOT-ERD-73-RR-16
See also PB-190 563.

Descriptors: *Concrete pavements, *Concrete finishing, Surface roughness, Surface finishing, Paving equipment, Slip forms, Equipment specifications, New York.

Paving procedures were monitored and performance surveyed for 5 years on 108 portland cement concrete pavement projects to determine the factors affecting as-built surface roughness. The California profilograph was reported earlier in this investigation to be a fast, accurate, and reproducible method of measuring roughness within a few hours after paving. By contrast, conscientious inspection with a 10-ft straight edge and correction of out-of-tolerance bumps during construction do not assure a smooth-riding pavement. Slip-form paving generally produces a much smoother surface than paving with conventional fixed sideforms. Although good results can be achieved by either method, neither assures smoothness. (Modified author abstract)

PB-228 581/5GA PC-GPO/MF$1.45-NTIS
Pavia-Byrne Engineering Corp., New Orleans, La.
HYPOCHLORINATION OF POLLUTED STORMWATER PUMPAGE AT NEW ORLEANS.
Environmental protection technology series,
Uwe R. Pontius, Edgar H. Pavia, and Donald G. Crowder. Sep 73, 201p W74-04676, EPA-670/2-73-067
Paper copy available from GPO $1.95 as EP1.23:670/2-73-067.

Descriptors: *Surface water runoff, *Chlorination, *Coliform bacteria, Sodium hypochlorite, Water pollution, Louisiana.
Identifiers: *New Orleans(Louisiana), Storm water runoff, Water pollution control.

Storm water from the streets of New Orleans flow to large drainage pumping stations where it is discharged into Lake Pontchartrain by means of long outfall canals. To reduce the coliform density, storm water was disinfected with sodium hypochlorite (NaOCl). Project facilities included manufacture, transportation, storage and feeding of 100 gram/l NaOCl. Sixteen high volume storms totaling 10 to the 9th power gal. of storm water were treated with more than 35,000 gal. of NaOCl. Long term fecal coliform levels were reduced by one order of magnitude in each outfall canal. (Modifed author abstract)

PB-228 582/3GA MF$1.45-NTIS
Utah Univ., Salt Lake City. Dept. of Biology.
WATER QUALITY REQUIREMENTS OF AQUATIC INSECTS.
Ecological research series rept.,
Arden R. Gaufin. Sep 73, 98p W74-04551, EPA-660/3-73-004
Contract DI-14-12-438
Paper copy available from GPO $1.20 as EP1.23:660/3-73-004.

Descriptors: *Water pollution, *Insects, *Aquatic biology, Arthropoda, Water quality, Ecology, Thermal properties, pH, Oxygen, Diptera, Tolerances(Physiology), Bioassay, Fishes, Temperature measurement.
Identifiers: *Aquatic insects, *Thermal pollution, Ephemeroptera, Plecoptera, Trichoptera, Amphipoda.

The larvae of twenty species of aquatic insects (Diptera, Ephemeroptera, Plecoptera, and Trichoptera) and the scud (Amphipoda) were exposed to high water temperatures, low dissolved oxygen concentrations, and low pH to determine their tolerance of these three environmental factors. The temperature at which 50% of the specimens died after 96 hours exposure ranged from 11.7C for the mayfly, Cinygmula par Eaton, to 32.6C for the snipe fly, Atherix variegata Walker. To maintain a well-rounded diversified population of cold water aquatic insects, maximum temperatures, minimum dissolved oxygen levels, and the pH range should not exceed the requirements of cold water fishes, such as trout and salmon. (Modified author abstract)

PB-228 584/9GA PC-GPO/MF$1.45-NTIS
Denver Univ., Colo. Dept. of Chemical Engineering and Metallurgy.

REMOVAL OF HEAVY METALS FROM MINE DRAINAGE BY PRECIPITATION.
Environmental protection technology series,
Laurence W. Ross. Sep 73, 71p W74-04851, EPA-670/2-73-080
Paper copy available from GPO $1.00 as stock no. EP1.23:670/2-73-080.

Descriptors: *Water pollution, *Mine waters, *Trace elements, Precipitation(Chemistry), Iron, Zinc, Aluminum, Copper, Manganese, Neutralizing, Colorado, Materials recovery Computerized simulation, Cost estimates.
Identifiers: *Mine acid drainage, Water pollution control.

Heavy metals in mine drainage waters of the Rocky Mountains can be removed by a two-stage process consisting of (1) neutralization followed by (2) sulfide treatment. The first stage removes ferric and aluminum hydroxides, and the second (sulfide) stage precipitates the heavy metals that are most objectionable as pollutants, and that are of possible interest for economic recovery. The two-stage process has been demonstrated in the laboratory and in a field experiment. (Modified author abstract)

PB-228 585/6GA PC-GPO/MF$1.45-NTIS
California Univ., Irvine.
EFFECT OF PHOSPHORUS REMOVAL PROCESSES ON ALGAL GROWTH.
Ecological Research series,
Jan Scherfig, Peter S. Dixon, Richard Appleman, and Carol A. Justice. Sep 73, 92p W74-04552, EPA-660/3-73-015
Contract EPA-WP-01446-01
Paper copy available from GPO $1.20 as stock no. EP1.23:660/3-73-015.

Descriptors: *Nutrients, *Algae, *Plant growth, Sewage treatment, Phosphorus, Bioassay, Lagoons(Ponds), Tests.
Identifiers: Limiting factors, Tertiary sewage treatment.

Laboratory studies were conducted to improve algal assay techniques for use in evaluation of sewage treatment processes. Laboratory studies (batch and continuous cultures) were conducted at the Santee California water reclamation plant to evaluate the effect of tertiary waste treatment processes on the amount of algal growth in the treated effluent. Laboratory studies were also conducted to determine the growth limiting nutrients in each type of tertiary effluent. Field tests were conducted using special study ponds and the results of the field tests were compared with the laboratory test results. The laboratory and field tests showed the same relative ranking for the treated effluents. (Author)

PB-228 586/4GA MF$1.45-NTIS
NUS Corp., Pittsburg, Pa. Cyrus Wm. Rice Div.
LABORATORY STUDY OF SELF-SEALING LIMESTONE PLUGS FOR MINE OPENINGS.
Environmental Protection technology series rept.,
Ray G. Penrose, Jr., and Igor Holubec. Sep 73, 231p W74-04559, EPA-670/2-73-081
Contract EPA-68-01-0135
Paper copy available from GPO $2.25 as EP1.23:670/2-73-081.

Descriptors: *Mine waters, *Neutralizing, *Sealing, Limestone, Pilot plants, Particle size distribution, Density.
Identifiers: *Mine acid drainage, Water pollution control.

Laboratory studies of self-sealing limestone plugs for mine openings were conducted to determine the optimum limestone material for such a treatment and sealant technique. Experimental results indicated that permeability, compressibility and strength of a limestone plug are primarily a function of the particle size distribution and density. Plug performance was most effective with high limestone placement density and smaller gradation of stone. Ferric waters were controlled most effectively. Additive effects were less significant throughout the tests. (Modified author abstract)

PB-228 588/0GA PC$11.50/MF$1.45
Georgia Inst. of Tech., Atlanta. Environmental Resources Center.
THE IDENTIFICATION AND QUANTIFICATION OF THE NET EFFECTS OF MULTIPLE-PURPOSE RIVER BASIN DEVELOPMENT,
Ronald M. North, and Jackie sellers. Jun 73, 167p ERC-0773 W74-04854, OWRR-A-040-GA(2)
Contract DI-14-31-0001-3810

Descriptors: *River basin development, Benefit cost analysis, Evaluation, North Carolina, Methodology, Project planning, Recreation, Flood control, Water quality, Economic analysis, Feasibility, Upper French Broad River Basin.

A methodological and pragmatic basis is presented from which to measure and evaluate future river basin development projects within the framework of multiobjective principles and standards. The Upper French Broad River Basin and a proposed 14-reservoir TVA project within the basin were selected for a case study of traditional benefit-cost analysis and subsequent multiple-objective comparisons with the national economic development, environmental, social, and regional economic development analyses. The areas of economic theory and public finance were integrated with the environmental aspects to develop a systematic process for evaluation of benefits and costs considering resources displaced as well as environmental and social costs imposed. The benefits claimed and views held for public investments in water rsources by various interest groups were explored for the region. (Modified author abstract)

PB-228 589/8GA PC$10.00/MF$1.45
Arizona State Univ., Tempe.
THE PUBLIC CONTROL OF PRIVATE LAND IN ARIZONA,
Milton R. Schroeder. Jul 73, 136p OEPAD-EP-74-1

Descriptors: *Regional planning, *Land use, *Arizona, State government, Legislation, Local government.

The study provides information about existing legal structure on which new legislation would be built. The report describes the authority to plan and control land use that is possessed by cities, towns, and counties in Arizona. It also describes the use of special districts and their impact on land planning and control. It also contains chapters on conflict and cooperation between local governmental units, regional planning in Arizona, the state role in land use planning and control, and the federal role in land use control.

PB-228 590/6GA PC-GPO/MF$1.45-NTIS
Dornbusch (David M.) and Co., Inc., San Francisco, Calif.
BENEFIT OF WATER POLLUTION CONTROL ON PROPERTY VALUES,
David M. Dornbusch, and Stephen M. Barrager. Oct 73, 155p W74-04550, EPA-600/5-73-005
Contract EPA-68-01-0753
Paper copy available from GPO $1.60 as EP1.23:6005-73-005.

Descriptors: Water quality, Benefit cost analysis, San Diego Bay, Kanawha River, Ohio River, Willamette River, Public opinion, Regression analysis.
Identifiers: *Water pollution control, *Property values.

This study was undertaken to determine the current state-of-knowledge concerning the measurement of the potential benefit of water pollution control on property values, and to analyze the relationship between water quality parameters and property values at several sites where water pollution has been substantially reduced in recent years. Multiple-regression analysis and an interview technique were employed to study the relationship between residential and recreational property values and water quality components. Study sites were located on San Diego Bay and the Kanawha, Ohio, and Willamette Rivers. It was found that effective pollution abatement on badly polluted water bodies can increase the value of single-family homes situated on waterfront lots by 8 to 25 percent, and that these water quality improvements can affect property values up to 4000 feet away from the water's edge. The measurable water quality parameters which have the greatest influence on property values are dissolved oxygen concentration, fecal coliform concentrations, clarity, visual pollutants (trash and debris), toxic chemicals, and pH. (Modified author abstract)

PB-228 601/1GA PC-GPO/MF$1.45-NTIS
GCA Corp., Bedford, Mass. GCA Technology Div.
WASTE AUTOMOTIVE LUBRICATING OIL AS A MUNICIPAL INCINERATOR FUEL.
Technical rept.,
Steven Chansky, Billy McCoy, and Norman Surprenant. Sep 73, 75p W74-044549, EPA-R2-73-293
Contract EPA-68-01-0186
Paper copy available from GPO $1.05 as EP1.23/2:73-293.

Descriptors: *Lubricating oils, *Motor vehicles, *Incinerators, Fuels, Waste disposal, Industrial waste treatment, Air pollution, Heat flux, Municipalities, Refuse disposal, Economic analysis, Oil storage.
Identifiers: *Liquid waste disposal, *Oil wastes.

The technical, economic and environmental impact of using waste automotive lubricating oils to improve the municipal incineration combustion process was examined. Laboratory analyses of selected physical properties of waste oil and a waste oil burner testing program were conducted to complement an information search program. The physical and chemical properties of waste oil were reviewed in relation to its suitability as a fuel oil. The auxiliary fuel heat flux requirements to offset the adverse effects of wet refuse were estimated utilizing a combustion model of a refuse bed. The impact on air quality from the combustion of waste oil in a municipal incinerator was estimated. Three-month average ground level concentrations for lead were calculated and presented as concentration isopleths. Capital Investment and operating costs were developed for auxiliary waste oil systems in conjunction with muncipal inceinerators. (Modified author abstract)

PB-228 604/5GA PC-GPO/MF$1.45-NTIS
Pacific Northwest Environmental Research Lab., Corvallis, Oreg.
REVIEWING ENVIRONMENTAL IMPACT STATEMENTS: POWER PLANT COOLING SYSTEMS, ENGINEERING ASPECTS.
Technology series rept.,
A. G. Christianson, F. H. Rainwater, M. A. Shirazi, and B. A. Tichenor. Oct 73, 101p W74-04555, EPA-6602-73-016
Paper copy available from GPO $1.35 as EP1.23:660/2-73-016.

Descriptors: *Cooling systems, *Environmental impact statements, *Electric power plants, Cooling systems, Thermal power plants, Nuclear power plants, Benefit cost analysis, Cooling towers, Reviews.
Identifiers: *Thermal pollution.

This report describes the approach and technical base that have been used by EPA's National Thermal Pollution Research Program for reviewing those portions of Environmental Impact Statements (EIS's) relative to the engineering aspects (including economics) of cooling water systems for thermal power plants. Techniques and data are provided to enable the EIS reviewer to make

sound judgements concerning the adequacy of both the cooling water system selected for the power plant and the EIS comments on that system. Literature citations are provided to direct the reviewer to additional and more detailed information. Information and discussions are provided on cooling system configurations, operation, environmental effects, and costs. Consideration is given to the intake as well as the discharge. (Modified author abstract)

PB-228 606/0GA PC$9.75/MF$1.45
Missouri Univ., Columbia. Dept. of Civil Engineering.
OPTIMIZATION OF OPERATION OF A SYSTEM OF FLOOD CONTROL RESERVOIRS.
Completion rept. 1 Jul 71-30 Jun 73,
Allen T. Hjelmfelt, Jr., and Nicos Xeni Tsiourtis. 1 Jul 73, 133p OWRR-B-065-MO(1), W74-04858
Contract DI-14-31-0001-3607

Descriptors: *Flood control, *Mathematical models, Optimization, Linear programming, Reservoirs, Probability, Time series analysis, River basin development.

Probabilistic methods of hydrology and optimization techniques were used to determine an optimal sequence of releases from a system of reservoirs during a flood emergency. The operation schedule for a reservoir was determined from estimated inflow to the reservoir, current reservoir contents and downstream conditions. Linear programming was used to establish the optimal operating procedure. The duration of the flood producing storm was divided into a series of equal time increments, an inflow into each reservoir estimated for each time increment and a release made from each reservoir during each time increment. The objective function (to be maximized) was taken to be the sum of all reservoir releases during the duration of flood inflow to the reservoirs.

PB-228 621/9GA PC$9.50/MF$1.45
IBM Federal Systems Div., Gaithersburg, Md.
STATE AIR DATA INFORMATION SURVEY.
Final rept.,
T. H. Lewis. Jan 74, 129p EPA-450/3-74-001
Contract EPA-68-02-1008

Descriptors: *Air pollution, *Data processing, Surveys, Computer programming, Questionnaires, Statistical data, Information systems.
Identifiers: *Air quality data.

The results of the State Air Data Survey were based on the states for which information was available in a timely fashion. The techniques presently used to store, access and maintain emission inventory and air quality files; significant problems associated with maintaining and using such files; and anticipated problems in meeting the proposed Federal regulations for the State quarterly and semi-annual reporting requirements, especially as related to providing data in standard EPA formats were addressed in this survey.

PB-228 644/1GA PC$16.50/MF$1.45
Iowa State Water Resources Research Inst., Ames.
THE HUMAN ECOLOGICAL IMPACT OF STRUCTURAL FLOOD CONTROL ON THE IOWA RIVER, IOWA.
Completion rept. 1 Sep-31 Oct 73,
James S. Gardner, and Nancy B. Hyltquist. Dec 73, 270p ISWRRI-58 W74-04856, OWRR-B-032-IA(1)
Contract DI-14-31-0001-3885

Descriptors: *Flood control, *Social change, *Iowa River, Coralville Dam, Coralville Reservoir, Iowa River, Urban planning, Recreation, Land use, Human ecology, Attitudes, Public opinion, Questionnaires, Iowa.

Human ecological impacts of the Coralville Dam and Reservoir, a flood control structure on the Iowa River, Iowa are described.Impacts include agricultural and urban land use changes, recreation participation growth, changes in stream hydrology, erosion, debris and problems associated with prolonged, controlled outflows from the dam and high water levels in the reservoir, and a number of indirect effects of these changes. Prolonged and high outflows from the dam have produced downstream flooding on agricultural land. Resulting conflicts between farmers and the Corps of Engineers over the flood control structure and its operation have lessened its beneficial image at the local level. The research indicates careful attention should be directed to scale of impact, dynamics of impact, zone or location of impact, socio-economic distribution of impact and components of impact, in environmental and human ecological analyses. (Modified author abstract)

PB-228 645/8GA PC$6.75/MF$1.45
Illinois Inst. for Environmental Quality, Chicago.
DEVELOPMENT OF A FLOOD AND POLLUTION CONTROL PLAN FOR THE CHICAGOLAND AREA: COMPUTER SIMULATION PROGRAMS.
Final rept. on Part 2,
D. H. Churchill. 31 Dec 72, 278p IIEQ-73-19
Prepared by Dept. of Public Works, Chicago, Ill.
See also PB-227 863.

Descriptors: *Flood control, *Surface water runoff, Computerized simulation, Combined sewers, Substitutes, Water pollution, Lake Michigan, Flood routing, Evaluation.
Identifiers: *Chicago(Illinois).

Several alternatives have been suggested for solving the waterway flood and pollution problems caused by combined sewer overflows in the Chicago Metropolitan Area. This report describes the evaluation of many of these alternatives with the same computer simulation models of hydrologic and pollution events. The criteria was established that the largest storm period or combination of storm and ground moisture conditions on record should not produce backflow to Lake Michigan, when applied to ultimate land and sewer development in the tributary combined sewer area. Continuous simulation models were then applied to the alternative plans to evaluate their relative effectiveness.

PB-228 649/0GA PC$7.50/MF$1.45
Colorado State Univ., Fort Collins. Environmental Resources Center.
SYSTEMATIC DESIGN OF LEGAL REGULATIONS FOR OPTIMAL SURFACE - GROUNDWATER USAGE. PHASE I.
Completion rept. 1 Jul 72-31 Aug 73,
H. J. Morel-Seytoux, R. A. Young, and G. E. Radosevich. Aug 73, 89p Completion-53 W74-04853, OWRR-B-076-COLO(2)
Contract DI-14-31-0001-3866

Descriptors: *Water rights, *Ground water, *Legislation, Law(Jurisprudence), Hydrology, Mathematical models, Colorado, New Mexico, Texas, California, Surface waters.

The report, the outcome of a one-year study, is made of three parts dealing respectively with the hydrologic, legal and economic aspects of conjunctive surface-groundwater management. Hydrologist, lawyers and economists have become increasingly and even painfully aware of the complex degree of interaction of their respective disciplines and as a result they have attempted to establish a connection. This report emphasizes the fact that the solution of the problem requires not just a mere juxtaposition of parts (a procedure acceptable as a start) but a complete integration from concepts down to coding details. (Modified author abstract)

PB-228 650/8GA PC$4.75/MF$1.45
Utah Water Research Lab., Logan.
COMPUTER SIMULATION OF THE HYDROLOGIC AND SALINITY FLOW SYSTEMS WITHIN THE BEAR RIVER BASIN.
Project completion rept. 1 Jul 71-31 Dec 73,
Robert W. Hill, Eugene K. Israelsen, and J. Paul Riley. Nov 73, 128p PRWG-104-1 OWRR-B-065-UTAH(1), W74-04860
Contract DI-14-31-0001-3658

Descriptors: *Bear River Basin, *Hydrology, *Salinity, Computerized simulation, Cache Valley, Utah, Irrigation, Mathematical models, Stream flow, Ground water.

Accompanying the increased use of water resources is an increased accumulation of chemical pollutants. To prevent degradation of the water resources beyond useful limits, pollution inputs from additional uses must be quite accurately predicted prior to implementation of the new use. The model described in this report was formulated to provide the required predictive capability for the Bear River Basin. In this study the model was synthesized on the hybrid computer and applied to the Cache Valley subbasin of the Bear River basin. The ability of the model to predict increased salt concentrations is demonstrated. A method for estimating and filling data gaps is also briefly discussed. (Modified author abatract)

PB-228 659/9GA PC$12.50/MF$1.45
Wisconsin Univ., Madison. Water Resources Center.
THERMAL EFFECTS ON BIOLOGICAL PRODUCTION IN A POND.
Doctoral thesis,
Horst F. Siewert. 1973, 186p W74-04861, OWRR-A-032-WIS(2)
Contract DI-14-01-0001-1870, DI-14-31-0001-3050

Descriptors: *Water pollution, *Ponds, *Thermal environments, *Biological productivity, Fishes, Chemical properties, Temperature measurement, Water chemistry, Oxygen, Nutrition, Alkalinity, Conductivity, Food supply, Hydrogen sulfide, Wisconsin, Theses.
Identifiers: Environmental effects, *Thermal pollution, *Lepomis cyanellus, *Chara.

Physical, chemical, and biological differences between two similar ponds were studied. One pond was heated to 5C above ambient temperature, while the other served as a reference. Two hundred and fifty green sunfish, Lepomis cyanellus, were planted in each pond. The young-of-the-year grew at a higher rate in the heated pond and permitted Chara to grow year round at an accelerated rate. The heated pond produced more oxygen during the day and lost more oxygen during the night than did the reference pond. There was an indication that the synergistic effect of temperature and oxygen with an unlimited food supply will promote fish growth.

PB-228 661/5GA PC$7.00/MF$1.45
Illinois Univ., Urban. Water Resources Center.
DEVELOPMENT OF A METER FOR MEASUREMENT OF SEWER FLOW.
Research rept.,
Harry G. Wenzel, Jr. Nov 73, 76p WRC-RR-74, UILU-WRC-73-0074 OWRR-B-063-ILL(2), W74-04857
Contract DI-14-31-0001-3581

Descriptors: *Sewer pipes, *Pipe flow, *Flowmeters, One dimensional flow, Flow measurement, Critical flow, Flow rate, Venturi meters, Design, criteria.

An experimental and analytical study was performed to develop the geometry for a venturi type flow meter for use in sewer flow measurement. The meter consists of a constriction in the pipe which produces critical flow under open channel flow conditions and acts as a conventional Venturi meter under full flow conditions. The constriction is constructed using cylindrical segments whose diameters are larger than that of the pipe and

which are attached to the sides of the pipe, leaving the invert and crown clear. Head loss characteristics and experimental rating curves for both open channel and full flow conditions are described. A procedure is presented, based on experimental data, to theoretically construct a rating curve if experimental calibration is impractical. Information is also presented to permit the selection of geometrical parameters for optimum performance for a specific installation.

PB-228 672/2GA PC$3.00/MF$1.45
Illinois State Water Survey, Urbana.
WATER QUALITY AND TREATMENT OF DOMESTIC GROUNDWATER SUPPLIES,
James P. Gibb. Dec 73, 20p ISWS-73-CIR-118

Descriptors: *Ground water, *Water supply, *Illinois, Water wells, Disinfection, Water quality, Minerals, Methane, Water softening, Cost estimates.

This circular presents basic information on water quality and treatment of domestic and farm groundwater supplies. It describes tests and practices that assure a safe sanitary water quality, and discusses in detail the common minerals and natural gases that are of concern to home water supplies in Illinois. It describes water treatment procedures and equipment for disinfection, iron removal, softening, methane and hydrogen sulfide gas removal, and their costs.

PB-228 681/3GA PC$5.50/MF$1.45
Illinois State Dept. of Transportation, Springfield. Bureau of Materials and Physical Research.
CONDITION OF LONGITUDINAL STEEL IN ILLINOIS CONTINUOUSLY REINFORCED CONCRETE PAVEMENTS.
Interim rept. Jan 7-Mar 73,
Jagat S. Dhamrait, Floyd K. Jacobsen, and Donald R. Schwartz. Mar 73, 48p Physical Research-43

Descriptors: *Concrete pavements, *Reinforced concrete, *Reinforcing steels, Reinforcing materials, Cracks, Corrosion, Corrosion environments, Durability, Illinois.
Identifiers: *Continuously reinforced concrete.

An investigation was made of several CRC pavements constructed within Illinois to determine the extent of corrosion occurring on the longitudinal reinforcement at transverse cracks. The effect of crack width, crack spacing, depth of reinforcement, slab thickness, and type of reinforcement were studied to determine their influence on the progression of corrosion. An analysis was made of 151 cores removed from 12 experimental pavements previously constructed throughout the State for an intensive study on the behavior of a variety of CRC pavement designs. The investigation also includes observations of 33 cores removed from the old Vandalia test pavement, which is of special interest because of its performance history and age. (Modified author abstract)

PB-228 682/1GA PC$10.25/MF$1.45
Michigan Univ., Ann Arbor. Highway Safety Research Inst.
EVALUATION OF TRAFFIC ACCIDENT EXPERIENCE FOR COUNTERMEASURE PROGRAM PLANNING.
Final rept.,
David K. Damkot, and William T. Pollock. Mar 73, 145p HSRI-320139-1

Descriptors: *Traffic safety, *Motor vehicle accidents, *Michigan, Projects, Models, Evaluation, Research.

Subsequent to discussion of practical goals in countermeasure project and program planning and evaluation, review of the 'project evaluation form' procedure developed for OHSP (Office of Highway Safety Planning) is provided. The remainder of the report reviews and updates the county accident characterization model developed earlier for OHSP. Strategies for use of this model, which involves normalizing county accident experience using registered vehicles and miles of roadway as exposure indicies, are discussed with respect to countermeasure planning and resource allocation.

PB-228 686/2GA PC$3.00/MF$1.45
Illinois State Water Survey, Urbana.
PLANNING A DOMESTIC GROUNDWATER SUPPLY SYSTEM,
James P. Gibb. Dec 73, 18p ISWS-73-CIR-116

Descriptors: *Water supply, *Ground water, *Water wells, Illinois, Design criteria, Reviews, Well pumps, Aquifers.

This circular presents basic information needed to plan and develop a domestic groundwater supply. A logical step-by-step planning summary is outlined. Accepted and recommended methods for a prospective owner of a domestic well to determine his water requirements and to gather meaningful information for planning his supply are presented. Also included are brief discussions on the occurrence, movement, availability, and quality of groundwater in Illinois, and the commonly used types of wells and pumps.

PB-228 687/0GA PC$3.00/MF$1.45
Illinois State Water Survey, Urbana.
WELLS AND PUMPING SYSTEMS FOR DOMESTIC WATER SUPPLIES,
James P. Gibb. Dec 73, 22p ISWS-73-CIR-117

Descriptors: *Water wells, illinois, Ground water, Reviews.

This circular presents basic information on wells and pumping systems used for farm and domestic groundwater supplies. It describes types of wells and their construction, development, and costs. It discusses the various types of pumps and pressure tanks, how to select them, and their costs. Suggestions on locating wells to prevent pollution and procedures for disinfecting a home water supply system are included.

PB-228 707/6GA PC-GPO/MF$1.45-NTIS
Environmental Protection Agency, Washington, D.C.
ENVIRONMENTAL PROTECTION AGENCY. A PROGRESS REPORT DECEMBER 1970-JUNE 1972.
Nov 72, 129p
Paper copy available from GPO $2.00.

Descriptors: *Environments, *Pollution, *Documentation, Air pollution, Water pollution, Solid waste disposal, Pesticides, Radiation, Noise, Economic analysis, Law enforcement, Legislation.

The Environmental Protection Agency is discussed from its inception to June 1972. Programs considered in this progress report are air quality, water quality, solid waste management, pesticides, radiation, and noise. Other topics considered are the economic impact of pollution control, regional, state, and local activities, enforcement, research and environmental monitoring, federal activities, and international activities.

PB-228 720/9GA PC$6.00/MF$1.45
California State Div. of Highways, Sacramento. Transportation Lab.
HIGHWAY RESEARCH REPORT: FILL STABILIZATION USING NON-BIODEGRADABLE WASTE PRODUCTS. PHASE I.
Interim rept.,
Joseph B. Hannon, and Raymond A. Forsyth. Aug 73, 57p CA-DOT-TL-2124-1-72-25

Descriptors: *Solid waste disposal, *Reclamation, *Earth fills, *Soil stabilization, Highways, Embankments, Shear strength, Triaxial tests, Cans, Glass, Automobile tires.
Identifiers: *Highway embankments.

This study is a laboratory investigation of the stabilizing effects of including various solid nonbiodegradable waste materials in four typical highway embankment soils. Waste materials included portions of discarded rubber automobile tires, broken glass containers and tin and aluminum cans. Compacted soil specimens with various percentages of waste materials in different layering systems were subject to large-scale triaxial compression testing to determine changes in shear strength parameters. These tests were performed under high stress conditions representative of high embankment construction (over 100 feet). Highway embankments are recommended for consideration as a possible disposal source for discarded solid non-biodegradable waste products. Also, there could be an economic benefit in reduced right-of-way width requirements resulting from steeper embankment slopes, as a result of the stabilizing effects of these waste products.

PB-228 736/5GA PC$13.75/MF$1.45
Environmental Protection Agency, Washington, D.C.
CONTROL OF HAZARDOUS MATERIAL SPILLS.
1974, 212p
Presented at the Proceedings of the National Conference on Control of Hazardous Material Spills (1972), Houston, Tex., 21-23 Mar 72.

Descriptors: *Hazardous materials, *Liquid waste disposal, Safety, Containment, Water treatment, Identifying, Water pollution, Ecology, Meetings.

Contents:
- The protection of the environment from hazardous material spills;
- Prevention of hazardous material spills in heavy process industries;
- Contingency planning for response to hazardous material spills;
- The containment of spilled hazardous materials;
- The detection and identification of hazardous material spills;
- Treatment systems for waters contaminated by hazardous materials;
- The effects of hazardous material spills on the environment;
- Ecology restoration of waterways following hazardous material spills.

PB-228 741/5GA PC$4.00/MF$1.45
National Field Investigations Center-Cincinnati, Ohio.
OPERATIONAL CONTROL PROCEDURES FOR THE ACTIVATED SLUDGE PROCESS. PART I. OBSERVATIONS,
Alfred W. West. Apr 73, 18p EPA-330/9-74-001-a
See also Part 2, PB-228 742.

Descriptors: *Activated sludge process, *Characteristics, Foam, Color, Odors, Sludge.

Aeration tanks and final clarifiers are studied perceptively for informative physical characteristics that help identify sludge quality and process status. They are scrutinized for clues that indicate the kind of control adjustments needed to achieve optimum plant performance. The inferences of such physical findings are used to supplement the results of other more specific control tests that dictate the direction and magnitude of the essential control adjustment.

PB-228 742/3GA PC$4.50/MF$1.45
National Field Investigations Center-Cincinnati, Ohio.
OPERATIONAL CONTROL PROCEDURES FOR THE ACTIVATED SLUDGE PROCESS. PART II. CONTROL TESTS,
Alfred W. West. Apr 73, 26p EPA-330/9-74-001-b
See also Part I, PB-228 741.

Descriptors: *Activated sludge process, *Tests, Turbidity, Settling, Dissolved gases, Oxygen, Centrifuging.

Control tests, that can be run as frequently as needed throughout each 24-hour cycle, reveal sludge quality, process status, and final effluent quality. Results of the settlometer, centrifuge and final clarifier sludge blanket level tests are used to calculate solids distribution ratios between the aeration tanks and the final clarifiers, sludge detention time in the final clarifiers and other factors influencing process performance.

PB-228 767/0GA PC$20.50/MF$1.45
Environmental Protection Agency, Wheeling, W. Va. Wheeling Field Office.
COOPERATIVE MINE DRAINAGE SURVEY, KISKIMINETAS RIVER BASIN.
Apr 72, 346p

Descriptors: *Pennsylvania, *Water pollution, *Mine waters, Surveys, Watersheds, Kiskiminetas River basin, Coal mines, Water quality.
Identifiers: *Mine acid drainage.

The purpose of this report is to provide basic data concerning sources of coal mine drainage in critical problem areas of the Kiskiminetas River basin. Information regarding the location, physical characteristics, and quantity and quality of point sources is requisite to the development of a program to reduce or eliminate the deleterious water quality affects of mine drainage. Descriptions of seven inventoried watersheds of the Kiskiminetas River basin are contained in the following sections of this document. There are seven separate sections, one pertaining to each watershed. Each section contains its own summary and conclusions, maps, water quality data, and related mine drainage information. Analyses for the individual discharging mine sites are shown in the appendices. A separate appendix is included for each of the individual watershed study areas.

PB-228 851/2GA PC$9.00/MF$1.45
Alaska Univ., College. Inst. of Water Resources.
WATER QUALITY IN ALASKAN CAMPGROUNDS,
R. Sage Murphy. Jun 73, 116p IWR-38 OWRR-B-009-ALAS(1), W74-04974

Descriptors: *Water quality, *Alaska, *Campsites, Potable water, Water pollution, Surface waters, Public health, Sewage, Water consumption, Ground water, Recreational areas, Acceptability, Swamps, Waste disposal.
Identifiers: *Campgrounds.

An evaluation is presented of water quality in Alaskan Campgrounds using laboratory determinations and on-site evaluations. In general, ground water quality was excellent and surface water quality unacceptable for human consumption and total body contact recreation. The most pressing need was the provision of an approved drinking water supply for each campground. The environmental health aspects of campgrounds were found to be largely neglected. Many of the sewage systems are inadequate, resulting in pollution of the ground and surface water. Finally, many campgrounds are located in swampy areas or in areas subject to annual flooding.

PB-228 853/8GA PC$13.75/MF$1.45
Delaware Univ., Newark. Water Resources Center.
WATER RESOURCES AS A BASIS FOR COMPREHENSIVE PLANNING AND DEVELOPMENT OF THE CHRISTINA RIVER BASIN.
Final rept.,
Joachim Tourbier. Apr 73, 212p W74-04988, OWRR-C-2185(3382)(1)
Contract DI-14-31-0001-3382

Descriptors: *Water resources, *Christina River Basin, *Land use, Comprehensive planning, Water quality management, Surface waters, Subsurface drainage, Urban areas, Regulations, Percolation, Policies, Probability theory, Classifications, Delaware.

The Christina River Basin near Wilmington, DE was used as a model area to determine methods that could be used by the public sector through its planning and regulatory powers to first assess the impact of land development upon water resources and certain hydrologic phenomena and then to create a responsive land use policy and program. The impact of urban development on the natural pattern of water flow is a function of two sets of variables, the natural characteristics of the land and the type and intensity of development. Land areas were classified into categories called site classes on the basis of the properties that influenced the water regimen. Land uses were described in terms of their water-related impact. A computer program then related environmental protection measures, measures that can be incorporated into development while it proceeds, to the variables of site class and land use intensity. The cost distribution of these measures was used to evaluate regional land use policies and to indicate areas of natural resources limitations to development, to allow for guidance of land uses to areas where they would do the least damage.

PB-228 854/6GA PC$15.00/MF$1.45
Arizona Univ., Tucson. Dept. of Hydrology and Water Resources.
WORTH OF DATA USED IN DIGITAL-COMPUTER MODELS OF GROUND-WATER BASINS.
Technical rept.,
Joseph Spencer Gates. Jun 72, 239p TR-8 W74-04975, OWRR-B-007-ARIZ(26)
Contract DI-14-01-0001-1876, DI-14-31-0001-3708

Descriptors: *Ground water, *Hydrogeology, Digital simulation, Computer programs, Evaluation, Data, Tucson basin, Arizona, Bayes theorem, Statistical decision theory, Errors, Predictions, Theses.

The worth of additional data to a digital model of the Tucson basin, Arizona was computed using a basic form of statistical decision theory (Bayesian). The model variables for which additional data were hypothesized included the aquifer coefficients of storage and transmissivity, initial water levels, discharge, and recharge. The worth of data was evaluated in terms of the expected reduction in error in predicted water levels associated with collection of more data on one variable at one point in the model. A limited number of tests suggested that the Tucson basin model could be improved most by obtaining more data on discharge and recharge in areas where these variables were large, and by obtaining more data on transmissivity where it was uncertain.

PB-228 868/6GA PC$10.25/MF$1.45
Pennsylvania State Univ., University Park. Inst. for Research on Land and Water Resources.
SOIL AS A MEDIUM FOR THE RENOVATION OF ACID MINE DRAINAGE.
Technical completion rept.,
Edward J. Ciolkosz, Louis T. Kardos, and William F. Beers. Dec 73, 145p W74-04981, OWRR-A-027-PA(1)
Contract DI-14-31-0001-4038

Descriptors: *Mine waters, *Water pollution, *Industrial waste treatment, *Soils, Percolation, Adsorption, Ion exchanging, pH, Soil properties.
Identifiers: *Mine acid drainage, Water pollution control.

This study determines the feasibility of using soils as a medium for the renovation of acid mine drainage. The detailed objectives were: to determine the ability of Rayne silt loam and Guernsey silty clay loam soils to renovate acid mine water, and to determine the effect of various soil properties on the reclamation of acid mine water.

PB-228 871/0GA PC$12.50/MF$1.45
Arizona Univ., Tucson. Dept. of Hydrology and Water Resources.
AN ANALYSIS OF THE WATER QUALITY PROBLEMS OF THE SAFFORD VALLEY, ARIZONA.
Technical rept. no. 15,
Anthony B. Muller, John F. Battaile, Leslie A. Bond, and Philip W. Lamson. Feb 73, 187p W74-04976, OWRR-A-999-ARIZ(3)

Descriptors: *Safford Valley, *Water quality, Arizona, Irrigation, Salinity, Aquifers, Ground water, Gila River, Hydrogeology, Economics.

Changes in groundwater quality averaging 0.13 millimhos electrical conductivity and 35 ppm chloride increase are documented between 1940 and 1972. The decrement in the water quality of the surficial aquifer is attributed to the interaction of four major mechanisms. Brine leakage from underlying artesian aquifers, natural recharge of the surficial aquifer by saline waters, recharge of the aquifer by concentrated agricultural waters, and lateral groundwater movement through saline lacustrine beds appear to be the major salt sources. A chemical thermodynamic computer model of recharge water quality, and the construction of iso-chemical maps from analyzed water samples show artesian aquifer leakage to be the significant contribution of salts to the system.

PB-228 914/8GA PC$8.00/MF$1.45
Kristof (Frank S.), Brooklyn, N.Y.
THE FEDERAL ROLE IN REHABILITATION AND NEIGHBORHOOD PRESERVATION,
Frank S. Kristof. 15 Jun 73, 98p HUD-PDR-407
Contract HUD-H-2116

Descriptors: *Urban renewal, *Community development, *Neighborhood rehabilitation, Central city, Urban revitalization, Federal policies, Population migrations, Socioeconomic status, Suburbs, Project planning, Housing studies.
Identifiers: *Housing and urban development research.

The study draws a number of conclusions from past neighborhood preservation and rehabilitation efforts and discusses changes in Federal legislation and administration that are required to initiate effective programs. The study examines the resources that are required to achieve the objectives that are recommended and explains a delivery system for reaching the objectives.

PB-228 921/3GA PC$8.00/MF$1.45
Environmental Protection Agency, Athens, Ga. Surveillance and Analysis Div.
A BACTERIOLOGICAL SURVEY OF THE LITTLE RIVER, SOUTH CAROLINA - CALABASH CREEK, NORTH CAROLINA AREA.
Nov 72, 98p

Descriptors: *Water quality, *Bacteria, *Little River, Sewage, South Carolina, Bacteria, North Carolina, Recreational facilities, Beaches, Inland waterways, Stream flow, Rivers, Salinity, Coliform bacteria, Salmonella, Water analysis.
Identifiers: Sewage treatment effluent.

The South Carolina Pollution Control Authority and the North Carolina Office of Water and Air Resources requested a bacterial water quality study be made in the Intracoastal Waterway - Calabash Creek area of North and South Carolina. The major objectives of the study were to determine: The major sources of bacterial contamination within the study area and their effects on bacterial water quality; water movement within the Intracoastal Waterway; the extent of saltwater intrusion in the Intracoastal Waterway; the bacterial quality of selected stormwater and waste discharges along the beach areas of Myrtle Beach and North Myrtle Beach, South Carolina.

PB-228 959/3GA PC$6.25/MF$1.45
Florida Univ., Gainesville.

THE CRITERIA FOR EVALUATING THE ROLE OF GOVERNMENT IN HOUSING MARKETS,
Alan R. Winger. 25 Jun 73, 64p HUD-PDR-127

Descriptors: *Residential buildings, Government policies, Market research.
Identifiers: *Housing and urban development research, *Low income housing.

The governments' role in housing should be linked to nations of allocative efficiency and equity. Efficiency criteria, even though currently difficult to implement, are unambiguous and widely accepted. Equity considerations are more elusive. Yet, they are no less important; individual views on government in housing often turn on what is considered as fair and just. Current research is increasing the ability of policy makers to act on the basis of efficiency criteria. Much more research on the equity issue is required before it can be dealt with in the same way.

PB-228 965/0GA PC$5.75/MF$1.45
ICF, Inc., Washington, D.C.
WHY PEOPLE MOVE AND AN EVALUATION OF POPULATION CHANGE AND COMMUNITY DEVELOPMENT/DECLINE. CHAPTER II.
2 Jul 73, 55p HUD-PDR-010-b
Contract HUD-H-2102

Descriptors: *Community development, *Population migrations, Surveys, Reviews.
Identifiers: *Housing and urban development research.

The report outlines the kinds of population changes there have been (and are likely to be) in the U.S. The study concentrates on where growth occurs and who moves, how frequently, at what poin in their life, from where, and to what type, of new location. The study explains why all this population change and movement transpired. Motives for selected types of movement are specified and the decision process surrounding changes in personal residence is examined. The report evaluates the effect of population change on community development and decline.

PB-228 976/7GA PC$6.25/MF$1.45
California State Div. of Highways, Sacramento. Transportation Lab.
STRUCTURE BACKFILL TESTING.
Final rept.,
Mas M. Hatano, ALBIN D. Hirsch, and Raymond A. Forsyth. Nov 73, 65p CA-DOT-TL-2130-1-73-41, 632130

Descriptors: *Backfills, Compacting, Density measurement, Radiation measuring instruments, Soil tests, Field tests, California.

The study was performed because of concern that the nuclear gage did not measure the density of structure backfill accurately due to the effect of concrete walls or pipes. Field and laboratory studies indicated that the gage is able to give a good estimate of the inplace density and that wall effect is not significant if the test is properly performed. Field correlation tests between sand volume and nuclear methods indicated the sand volume tended to give slightly higher test results. Laboratory research also indicated the sand volume tends to measure above the true density when the density of the material is above 120 pcf. This study indicated the relative compaction specification of 95 percent should be retained.

PB-228 997/3GA PC$9.00/MF$1.45
Alabama Highway Research Group, University.
STUDIES OF OPTIMAL MODELS OF INTERCHANGE DEVELOPMENT THROUGH LAND USE REGULATIONS AND CONTROL.
Rept. for 28 Jul 70-31 Aug 72,
Joseph Barry Mason, and Charles Thomas Moore. Aug 72, 449p HPR-72-A

Descriptors: *Highway planning, *Interchanges, *Land use, *Alabama, Urban development, Interstate highway system, Models, Economic development.

The report examines economic development, motorist service aspects, and land use controls of highway interchange areas. Data collected by the Alabama Highway Department on 157 Interstate highway interchanges using aerial photography and field visits to describe land use changes between 1964 and 1970 in the interchange area (one-half mile along each approach route to the interchange) are analyzed.

PB-229 015/3GA PC$3.25/MF$1.45
Tri-State Regional Planning Commission, New York.
URBAN CORRIDOR DEMONSTRATION PROGRAM EXCLUSIVE BUS LANE. INTERSTATE 495-NEW JERSEY APPROACH TO LINCOLN TUNNEL.
Final rept. Oct 70-Dec 71,
Leon Goodman. Jul 72, 40p UMTA-IT-06-0062-72-1, UMTA-UCDP-73-4
Contract FH-11-7646
See also PB-212 992.

Descriptors: *Urban transportation, *Bus lines, *New York, Mass transportation, Vehicular traffic, Projects, Freeways, Evaluation, Urban planning, Traffic surveys, New Jersey.
Identifiers: *Exclusive bus lanes, Interstate highway 495.

An exclusive bus lane for eastbound buses along a 2.5 mile stretch of Interstate 495, between the Lincoln Tunnel and the New Jersey Turnpike, was implemented in December 1970 as a major part of the United States Department of Transportation's Urban Corridor Demonstration Program. The exclusive bus lane project described in the report demonstrates how a public transportation improvement can be established quickly and at a relatively low cost in an urban area where several planning and operating agencies have jurisdiction. The report summarizes the history and first year details of operation of the special bus lane and explains the future plans for the bus lane. Conclusions arrived at from the day to day running of the demonstration bus lane complete the synopsis of results of the first exclusive bus lane in the greater New York City Metropolitan Region and the first reverse-flow exclusive bus lane on a freeway in the United States.

PB-229 087/2GA PC$4.50/MF$1.45
Cornell Univ., Ithaca, N.Y. Water Resources and Marine Sciences Center.
REASONABLE STATE REGULATION OF THE INTERSTATE TRANSFER OF PERCOLATING WATER.
Technical rept.,
Michael D. White. May 73, 30p TR-64 W74-04980, OWRR-A-027-NY(3)
Contract DI-14-01-0001-1852

Descriptors: *Water law, *Interstate transportation, *Ground water, Water supply, Legislation, Water pollution, Conservation, Percolation.

Recently, Federal and State agencies have instituted water management and programs to prevent and/or clean up water pollution for purposes of maintaining the availability of adequate water supplies. Significant problems in water supply, however, result in transferring quantities of water between states. In view of the present national water crisis, Federal government regulation of interstate water transfer is often advocated. But in the absence of Federal action, the states must protect and manage their own groundwater resources. States can protect their percolating water resources only by valid conservation laws, not by antiexport statutes which discriminate against out-of-state users.

PB-229 181/3GA PC$12.50/MF$12.50
New Mexico Univ., Albuquerque. Technology Application Center.
WASTE GLASS UTILIZATION. CUMULATIVE VOLUME.
30 Jun 73, 222p* TAC/WGS-74-301
Available to non-U.S. addresses PC$15.00, MF$15.00.

Descriptors: *Glass, *Solid waste disposal, *Reclamation, Aggregates, Paving, Foam, Grinding(Comminution), Crushing, Economics, Cement additives, Regulations, Abstracts, Symposia, Construction materials.
Identifiers: *Waste recycling, Glass recycling.

Glass, as a by-product of the total recycling process, may soon be available in quantities sufficient not only for the manufacture of more glass, but for use in a wide variety of secondary products. These products may range from resurfacing materials which can be used under a greater variety of environmental conditions than asphalt, to glass wool and construction panels. To explore these new products, a 'Symposium on the Utilization of Waste Glass in Secondary Products' was held in Albuquerque, January 24-25, 1973. This document is an updated version of a state-of-the-art survey on the use of glass in secondary products, first prepared for the Symposium.

PB-229 209/2GA PC$10.00/MF$1.45
Housing Assistance Council, Inc., Washington, D.C.
AN ANALYSIS OF ALTERNATIVE LOW-INCOME RURAL HOUSING SYSTEMS.
Final rept.,
Gordon Cavanaugh. 29 Jun 73, 137p HUD-PDR-406

Descriptors: *Low income housing, *Rural areas, Public housing projects, Surveys, Problem solving, Recommendations, Economic development districts, Housing agencies, Cost analysis, Defects, Systems analysis, Georgia, Colorado, South Carolina, Mississippi, Tennessee, Vermont.
Identifiers: Alternatives, *Housing and urban development research.

The study examines several areas' housing authorities with regard to their public housing alternatives, and outlines the problems of small housing authorities. The report includes a design of a model agency and makes administrative and legislative recommendations.

PB-229 297/7GA PC$17.00/MF$1.45
Environmental Protection Agency, Washington, D.C. Office of Research and Development.
EXPRO 74. A LISTING OF EXTRAMURAL PROJECTS TO BE FUNDED IN FISCAL YEAR 1974.
Nov 73, 278p
See also report dated Oct 72, PB-213 337.

Descriptors: *Solid waste disposal, *Air pollution, *Water pollution, *Contract administration, Public health, Research management, National government, Ecology, Pesticides, Sewage treatment, Water quality, Radiation effects, Industrial waste treatment, Air pollution control equipment, Hazardous materials, Noise.

The Environmental Protection Agency's Office of Research and Development (OR and D) conducts and supports research, development and demonstration efforts on a wide variety of subjects primarily related to pollution sources and effects, environmental sciences and pollution control technology. The purpose of EXPRO is two-fold: To acquaint the research and development community with general guidelines for working with the Environmental Protection Agency's Office of Research and Development under grant or contract support, and to make publically available a list of specific grant and contract Tasks which OR and D plans to fund during Fiscal Year.

PB-229 344/7GA PC$5.25/MF$1.45
Jacobs (Eugene B.), Los Angeles, Calif.
FINANCING OF CALIFORNIA REDEVELOPMENT PROJECTS,
Eugene B. Jacobs. 1973, 41p HUD-PDR-420

Descriptors: *Urban renewal, *California, *Finance, Blighted areas, Rehabilitation.
Identifiers: *Housing and urban development research.

Contents:
The redevelopment process in California;
Financing methods available in California;
Community redevelopment administrative fund;
Redevelopment revolving fund;
Agency bonds;
Tax increment financing techniques employed in California;
Method of establishing land prices and offering redevelopment land for sale and development.

PB-229 345/4GA PC$6.25/MF$1.45
Harvard Univ., Cambridge, Mass. Dept. of Economics.
POLICIES OF HOUSING SUPPORT: RATIONALE AND INSTRUMENTS,
Richard A. Musgrave. 14 Jul 73, 63p HUD-PDR-118

Descriptors: *Residential buildings, *Government policies, *Finance.
Identifiers: *Low income housing, *Public housing, *Housing and urban development research.

The paper focuses on the rationale for government support of housing and its implementation. To establish such a rationale, 'merit good considerations' must be introduced according to which housing is considered a form of consumption which society views more important than allowed for by individual consumer choices. The social evaluation may be directed either at home ownership or at the provision of minimum housing levels i.e. avoidance of housing poverty. This should include rent support to the occupier conditional on own-expenditures being maintained at a set fraction of income. Such supports need be supplemented by measures aimed at increasing the supply of low cost housing as well as improved public housing to deal with situations of particular housing distress.

PB-229 416/3GA PC$4.50/MF$1.45
Commonwealth Scientific and Industrial Research Organization, Melbourne (Australia). Div. of Building Research.
DESIGN SENSITIVITY STUDIES ON SIMPLE SPAN PRESTRESSED CONCRETE BEAM AND SLAB HIGHWAY BRIDGE SUPERSTRUCTURES,
R. M. Schmidt, and J. F. Brotchie. 1973, 29p
Technical paper-31, ISBM-0-643-00079-8

Descriptors: *Highway bridges, *Concrete construction, *Cost comparison, Bridge decks, Concrete slabs, Beams(Supports), Prestressed concrete, Reinforcing steels, Australia.

The results of a set of parametric studies on straight, simple span prestressed concrete beam and slab highway bridges are presented as tabulated information for design. The basic data on design parameters and unit costs are typical of current practice and cover a range of spans and all four beam types. Different parameters are then varied, one at a time, and the consequences on cost and on key structural sizes are determined. Proposed metric sections are also studied and key cross-sectional dimensions are varied to indicate where improvements might be made. (Author)

PB-229 605/1GA PC$9.00/MF$1.45
Lehigh Univ., Bethlehem, Pa. Fritz Engineering Lab.
HYDRAULIC PERFORMANCE OF PENNSYLVANIA HIGHWAY DRAINAGE INLETS INSTALLED IN GRASSED CHANNELS (TYPE H, TYPE 4-FT., AND TYPE 6-FT.).
Final rept.,
Erik Appel, Arthur Brune, and Walter H. Graf.
Jan 73, 120p FEL-364.4
See also PB-222 488.

Descriptors: *Highways, *Drainage, *Drains, Pennsylvania, Grilles, Surface water runoff, Dikes, Embankments, Open channel flow, Hydraulic gradients.

The capacities of three different standard inlet grating installed in grassed channel by the Pennsylvania Department of Transportation were determined in a grassed drainage channel equipped with adjustable slopes. The longitudinal slope ranged from 0.5% to 8%; the swale slope was either 12:1 or 6:1; and the other slope ranged from 12:1 to 1/2:1. The drainage inlets studies were type H inlet, type 4-Ft inlet, and type 6-Ft inlet. The gratings used with the type H inlet consisted of the standard and two proposed gratings. Each model inlet grating was built to half the scale of the prototype and was tested under several channel configurations and with a range of channel flow rates. The capacity of an inlet grating was determined by actual measurements, and thus the efficiency of the grating was obtained. (Modified author abstract)

PB-229 625/9GA PC$15.25/MF$1.45
Environmental Protection Agency, Washington, D.C.
IN THE MATTER OF POLLUTION OF THE NAVIGABLE WATERS OF PEARL HARBOR AND ITS TRIBUTARIES IN THE STATE OF HAWAII. TECHNICAL SESSION OF THE CONFERENCE HELD AT HONOLULU, HAWAII ON JUNE 5-6, 1972. TRANSCRIPT OF THE PROCEEDINGS.
1972, 242p
See also PB-229 626.

Descriptors: *Water pollution, *Hawaii, *Harbors.
Identifiers: *Navigable waters, *Pearl Harbor, *Tributaries.

The report includes statements and discussion on the technical session of the conference in the matter of pollution of navigable waters of Pearl Harbor and its tributaries in the state of Hawaii for 1972.

TT-72-56069/1-4 PC$8.00/MF$1.45
Department of the Interior, Washington, D.C.
TRANSACTIONS OF THE JAROSLAV CERNI INSTITUTE FOR DEVELOPMENT OF WATER RESOURCES. VOLUME 17, NUMBERS 50-53 1972.
1973, 366p
Trans of Institut za Vodoprivredu 'Jaroslav Cerni'. Saopstenja (Yugoslavia v17 n50-53 1972, by Jelena Markovic and Vojislav Pavasovic. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Yugoslavia, *Periodicals, *Water resources, Danube River, Dams, Hydraulic models, Sedimentation, Hydroelectric power generation, Construction.

Hydraulic studies for the Derdap Hydroelectric and Navigation System were conducted at hydraulic research centers in Belgrade and Bucharest between 1962 and 1971. The following related topics are discussed in this report: Hydraulic problems and their solution; hydraulic studies for diversion of the river; hydraulic studies for the main structure; hydraulic studies for the principal structures; the problem of seepage; study of the movement of sediment upstream from the dam; and, unsteady regime.

13C. Construction Equipment Materials, and Supplies

AD-774 983/1GA PC$3.75/MF$1.45
Ingersoll-Rand Research Inc Princeton N J
THE DESIGN OF AN EXPERIMENTAL HIGH ENERGY IMPACT TUNNELER.
Annual rept. Oct 72-Jun 73,
Mukund D. Gangal. Jun 73, 56p Rept no. TM-7307
Contract H0230006, ARPA Order-1579
See also AD-745 008.

Descriptors: *Tunneling, *Hammers, Hydraulic equipment, High energy, Impact, Rock mechanics, Fracture(Mechanics), Impact tests, Field tests.
Identifiers: *Impact hammers, Imp-1000 impact hammers.

The research program emphasized the field testing of a medium energy impact breaker IMP-1000. Quantitative data were obtained on the effect of the variation of blow energy, blow spacing and tool point geometry on the amount of rock broken during the excavation. Motion picture records and other qualitative observations were made. In addition to the field work, Demon 300 tool was repaired for future use, an impactor capable of delivering 50,000 ft. lb/blow was sized up and laboratory rock tests were conducted to obtain qualitative data on edge fracture. (Author)

PB-228 449/5GA PC$9.50/MF$1.45
Purdue Univ., Lafayette, Ind. Joint Highway Research Project.
AN INVESTIGATION INTO THE GRADATION VARIABILITY OF AGGREGATES USED IN BASES.
Final rept.,
James T. Parson. Jul 72, 130p JHRP-14-72
Prepared by Indiana State Highway Commission, Indianapolis, and Federal Highway Administration, Washington, D.C.

Descriptors: *Pavement bases, *Aggregates, *Quality control, Variations, Base courses, Pug mills, Sampling, Field tests, Indiana, Theses.

The research project dealt with quality control of gradation of base course material used under concrete pavement. The primary purpose of the research was to establish guidelines for detecting change in quality (gradation) between the aggregate producers plant and the insitu compacted highway base. The aggregate study dealt with Indiana specification No. 53, Pugmill mixed crushed limestone aggregate. Variation between sampling points was studied by obtaining samples at four locations, pugmill feeder belt, pugmill output, on the roadway before compaction and on the roadway after compaction. The variability of the material was evaluated on a statistical basis.

PB-228 473/5GA PC$6.25/MF$1.45
Minnesota Dept. of Highways, St. Paul. Office of Research Coordination.
MODERN CONCEPTS FOR DENSITY CONTROL. PHASE I. BITUMINOUS WEARING COURSES.
Final rept. 1973,
R. O. Wolters. 1973, 63p Investigation-191-FR, MN-HW-5-180-73-5
Prepared in cooperation with Federal Highway Administration, Washington, D.C.

Descriptors: *Flexible pavements, *Bituminous coatings, *Density measurement, Sampling, Bulk density, Compacting, Materials specifications, Minnesota.

During 1969, 1970 and 1971 density data were obtained on bituminous wearing courses that were being constructed on several Minnesota trunk highways. Data were collected and analyzed from randomly selected locations on five bituminous surfacing projects. A statistical analysis was also performed on results from eleven other bitu-

minous projects and on laboratory test results. Variation was determined from these data by computing the mean and standard deviation to reveal existing variability in acceptable construction of bituminous wearing courses. The results were used to evaluate present specifications and to develop a new acceptance sampling plan.

SLA-73-564 PC$4.25/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
RIGGING EQUIPMENT MANUAL: DESIGN, FABRICATION, INSPECTION, USE, AND TESTING.
L. Stinnett. Nov 73, 42p
Contract AT(29-1)-789

Descriptors: (*Materials handling, *Manuals), Equipment, Fabrication, Mechanical structures, Performance testing, Safety standards, Specifications.

For abstract, see NSA 29 05, number 12480.

TT-71-54025/3-4 PC$6.50
Department of Housing and Urban Development, Washington, D.C. Office of International Affairs.
BUILDING REVIEW. VOLUME 43, NUMBERS 3-4 1971.
1973, 252p
Trans. of Przeglad Budowlany (Poland) v43 n3/4 p113-222 1971, by Helena M. Massey and Wojciech Roszkowski. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Construction, *Reviews, Structural design, Construction materials, Construction equipment, Residential buildings, Translations, Poland.

Articles are presented on various topics in the construction industry, such as safety, industrialization, building equipment, operations, reconstruction, and economics.

13D. Containers and Packaging

AD-775 101/9GA PC$4.00/MF$1.45
E F Industries Inc Louisville Colo
EXPLOSIVE WELDED TANKAGE.
Final rept. 11 Sep 72-15 Sep 73,
L. E. Jensen, and J. D. Mote. Jan 74, 84p Rept no. TR-EF15-121 AFRPL-TR-73-97
Contract F04611-73-C-0018

Descriptors: *Storable rocket propellants, *Propellant tanks, *Explosive welding, Pressure welding, Bonding, Welded joints, Tensile properties, Leakage(Fluid), Test methods.

The report covers the design, development, fabrication, test and evaluation of joints applicable to large rocket propellant containers. The joints were fabricated by explosive welding techniques and were made from 18% Nickel Maraging Steel Grade 250. The objective of this program was to show feasibility in bonding this material into joints having zero leak potential and possessing parent material strength. (Modified author abstract)

AD-775 421/1GA PC$3.00/MF$1.45
Picatinny Arsenal Dover N J
XM511E2 SHIPPING AND STORAGE CONTAINER SADDLE LINER MATERIAL.
Technical memo.,
Eugene S. Farbanish. Jan 74, 10p Rept no. PA-TM-2132

Descriptors: *Warheads, *Shipping containers, *Packing materials, Polyethylene, Linings, Test methods, Adhesion.
Identifiers: M-511 containers, M-234 warheads, XM-511E2 containers, XM-234 warheads.

A number of barrier materials for use as an XM511E2 shipping and storage container saddle liner were tested. The saddle liner is required to prevent adhesion between the container rubber saddle-cushioning material and the XM234 warhead section during storage. Polyethylene material has successfully been used for this purpose and is presently being utilized in field systems. Test results have shown that bleeding of the saddle cushioning material will stain and discolor the XM234 warhead section. Therefore, tests were conducted on a number of materials to locate a saddle liner which would eliminate the bleed through and prevent adhesion. (Author)

AD-775 431/0GA PC$3.25/MF$1.45
Budd Co Fort Washington Pa Technical Center
TEST REPORT - CORNER ASSEMBLY FOR MODULAR CONTAINER.
Final rept.,
M. Frankel. 28 Feb 74, 32p Rept no. TC-0089
Contract DAAK02-73-C-0298

Descriptors: *Military equipment, *Shipping Containers, Structural members, Castings, Welded joints, Loads(Forces), Compression, Test methods.
Identifiers: *Modular containers.

The report contains a description of the testing and results of simulated corner assemblies. These assemblies represent a portion of the cargo container design. A tension test to ultimate design load was performed to verify the integrity of the cast stainless steel castings. The castings proved capable of sustaining loads beyond requirements and therefore no major modifications can be recommended. A compression test with its goal to the ultimate design load was performed to verify the column design. The column indicated torsional instability at 86% of the ultimate design load and the test was terminated at this point. A minimal design effort can easily bring the column strength up to load requirements. (Modified author abstract)

PATENT-3 782 698 Not available NTIS
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
HEATER-MIXER FOR STORED FLUIDS.
Patent.
T. N. Canning. Patented 1 Jan 74, 4p NASA-CASE-ARC-10442-1,
Misc-Filed 11 Aug. 1972 Supersedes N73-30415 (11 - 21, p 2547).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Cryogenic fluid storage, *Cryostats, *Jet nozzles, *Pressure vessels, *Thermal insulation, Equipment specifications, Heat transfer, *Patents, Product development, Thermodynamic properties.

A fluid storage vessel for containing cryogenic fluids is described. The storage vessel contains an auxiliary chamber which is connected to the main container by a jet nozzle. The wall of the auxiliary vessel is heat cycled to produce a corresponding expansion and contraction of the fluid within the auxiliary chamber. This action causes heating and mixing of the stored fluid by means of jetting the expanded fluid to and from relative to the stored fluid contents of the vessel.

13E. Couplings, Fittings, Fasteners, and Joints

CEA-CONF-3447 PC$3.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France). Div. De Metallurgie et d'Etude des Combustibles Nucleaires.
CONTROL OF WELDED JOINTS ON A TUBULAR PLATE BY ULTRASONICS AND GAMMAGRAPHY.
C. Cherpentier, M. T. Destribats, F. Papezyk, and M. Dobrowolski. Jan 73, 6p CONF-730606-4
In French. U.S. Sales Only.

Descriptors: (*Welded joints, *Quality control), (*Gamma radiography, Welded joints), (*Ultrasonic testing, Welded joints), Pipes, Steels, Thulium 170, Welding.

For abstract, see NSA 29 05, number 10089.

PATENT-3 845 861 Not available NTIS
Department of the Interior, Washington, D.C.
CLOSURE FOR EVACUATED AND/OR PRESSURIZED VESSEL.
Patent,
Wesley E. Dieter, Paul L. Golden, and Stanley Nazaruk. Filed 1 Dec 59, patented 24 Jul 62, 5p PAT-APPL-856 624, DOCKET/MIN-384
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Closures, *Patents, Pressure vessels, Seals(Stoppers), Locking.
Identifiers: PAT-CL-220-57.

The patent relates to a door or closure, and locking means therefor, and more particularly to a closure and locking means for devices wherein a fluid-tight seal is required. Devices and applications wherein the invention is useful include pressure cookers, vacuum chambers, sterilizers, air locks in dry boxes, hatch covers, etc.

PATENT-3 148 577 Not available NTIS
Department of the Interior, Washington, D.C.
ROCK BOLT ANCHORED BY EXPLOSIVE FORMING.
Patent,
Edward W. Parsons. Filed 27 Feb 62, patented 15 Sep 64, 5p PAT-APPL-176 160,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Rock bolts, *Patents, Explosive forming, Mines(Excavations), Fasteners, Anchor bolts.
Identifiers: PAT-CL-85-65.

The invention relates to improvements in rock bolts used in mining and construction operations as an aid in the support of rock around underground openings or surface rock exposures. Such bolts have particular utility for reinforcing rock formations by providing subsidiary support under sagging or weakened strata of these formations.

WAPD-TM-1106 PC$4.50/MF$1.45
Bettis Atomic Power Lab., Pittsburgh, PA. (Usa).
EFFECTS OF NEUTRON IRRADIATION ON THE FRACTURE PROPERTIES OF A302B PRESSURE VESSEL STEEL WELDMENTS.
J. F. Hall, and D. J. Seman. Jul 73, 49p
Contract AT-11-1-GEN-14

Descriptors: (*Steel-astm-a302, *Physical radiation effects), (*Pressure vessels, *Welded joints), Fast neutrons, Fractures, Heat affected zone, Neutron beams, Transition temperature.

For abstract, see NSA 29 05, number 10745.

13F. Ground Transportation Equipment

AD-775 433/6GA PC$4.00/MF$1.45
Army Test and Evaluation Command Aberdeen Proving Ground Md
CRANE TRUCK, WAREHOUSE.
Final rept. on test operations procedure.
8 Jan 74, 11p Rept no. TOP-9-2-063
Supersedes AD-718 575.

Descriptors: *Cranes, *Trucks, *Test methods, Safety, Reliability, Maintenance, Acceleration, Braking.
Identifiers: *Common engineering test procedures.

The document provides a system for evaluation of warehouse crane truck performance characteristics. It discusses test planning and preliminary requirements for initial inspection, physical characteristics, servicing, training, safety precautions, run-in operations, and facilities; lists references for performance tests of clutch pedal, steering wheel, service brake, towing hook, load line hook, boom topping, sluing, crane speed, acceleration, acceleration response, slope ascension, parking brake, underclearance, stopping distance, stability, lifting attachments, structural load and overloads, turning radius, power train static torque, controls hook and cable; for post-test maintenance and inspections; and for endurance, transportability, maintenance, safety, human factors evaluation, and reliability. The document applies to gasoline-driven and electric cranes. Excludes techniques for some special purpose crane trucks.

AD-775 434/4GA PC$4.00/MF$1.45
Army Test and Evaluation Command Aberdeen Proving Ground Md
ENDURANCE TESTING OF TRACKED VEHICLES.
Final rept. on test operations procedure.
21 Dec 73, 16p Rept no. TOP-2-2-507
Supersedes AD-717 994.

Descriptors: *Tracked vehicles, *Test methods, Lubrication, Endurance(General), Performance(Engineering), Reliability, Fuel consumption, Maneuverability.
Identifiers: *Common engineering test procedures.

The document describes a method for evaluating tracked vehicle endurance characteristics. It discusses pretest requirements for initial inspection and lubrication, break-in operations, simulated payloads, facilities and equipment; it groups vehicles by mission and includes a mileage schedule on prescribed test courses for each vehicle group, and describes the use of a tachograph. (Author)

AD-775 441/9GA PC$4.25/MF$1.45
Army Test and Evaluation Command Aberdeen Proving Ground Md
BROADBAND ELECTROMAGNETIC INTERFERENCE TESTING FOR VEHICLES AND ELECTRICAL SUBSYSTEMS: NONCOMMUNICATIONS.
Final rept. on test operations procedure.
1 Feb 74, 25p Rept no. TOP-2-2-613

Descriptors: *Military vehicles, *Electromagnetic interference, Vulnerability, Emission spectra, Electromagnetic shielding, Suppressors, Test methods.
Identifiers: *Common engineering test procedures.

The report prescribes procedures for measuring frequencies and amplitudes of electromagnetic emissions from vehicles and vehicular equipment, including noncommunication electrical subsystems, to determine whether these emissions will produce interference to the vehicle's electronic and electromechanical equipment. Both radiated and conducted emissions are measured, and radio frequency suppression systems are evaluated. Definitions of applicable terminology are provides It is not applicable to emissions from communications electronic equipment and electric handtools. (Author)

COM-74-50286/3GA Not available NTIS
National Bureau of Standards, Washington, D.C.
SUPERCONDUCTING LEVITATION OF HIGH SPEED VEHICLES.
Final rept.,
Vincent D. Arp, Alan F. Clark, and Thomas M. Flynn. 1973, 13p
Pub. in Transp. Eng. J. 99, nTE4 p873-885 Nov 73.

Descriptors: *Rapid transit railways, *Suspension systems(Vehicles), *Superconducting magnets, Urban transportation, Fatigue life, Cryogenics, Magnetic properties.
Identifiers: *Magnetic levitation.

The current status (December 1972) of worldwide research on high speed ground transportation techniques is reviewed. Particular attention is given to studies of magnetic levitation using superconducting magnets, including comparison with alternative magnetic techniques and with air suspension systems. Superconducting levitation appears to be a strong contender in the U.S. Department of Transportation hopes to select in the late 1970's the best of the possible levitation techniques for subsequent advanced development. Cryogenic engineering research needed in support of major development of a superconducting levitated system is identified. (Author)

PB-228 136/8GA PC$3.75/MF$1.45
Transportation Systems Center, Cambridge, Mass.
ANALYTICAL FINITE ELEMENT SIMULATION MODEL FOR STRUCTURAL CRASHWORTHINESS PREDICTION.
Interim rept. Apr-Sep 73,
S. Pasternack. Oct 73, 65p DOT-TSC-NHTSA-73-12 DOT-HS-801 018

Descriptors: *Motor vehicles, *Dynamic structural analysis, Automobile bodies, Frames, Mathematical models, Equations.
Identifiers: *Crashworthiness.

Incremental equations governing the nonlinear elasto-plastic dyanmic response of three-dimensional frame structures are derived, where the associated stiffness and compatibility matrices also incorporate large geometry changes. A discussion of yield criteria is given, together with bound type estimates for thin walled cross section beams. The Newmark beta method is then used to solve the equations of motion, and is oriented toward the particular incremental equations typical of the present application.

PB-228 470/1GA PC$4.50/MF$1.45
Mitre Corp., McLean, Va.
EVALUATION OF URBAN TRANSIT BUS MODIFICATION KITS TO REDUCE ENGINE SMOKE, ODOR, NOXIOUS EMISSIONS AND NOISE.
Final rept.,
G. F. Swetnam, and F. L. Willingham. 31 May 73, 120p MTR-6413-Rev-1 UMTA-IT-06-0022-73-1
Contract DOT-UT-10028

Descriptors: *Buses(Vehicles), *Modification kits, Exhaust emissions, Odors, Motor noise, Performance tests, Benefit cost analysis.
Identifiers: Exhaust emission control devices.

The Truck and Coach Division of General Motors Corporation (GMC) has developed a modification kit for the current series of GMC diesel transit buses. The kit, known as the EIP Kit, is designed to reduce toxic emissions, odor, smoke, and noise, and can be installed on all GMC transit buses manufactured since 1959. A two-year field evaluation of this kit has been conducted. Toxic emissions, smoke, and noise from buses equipped with the kit were compared with those from control buses in Washington, D.C.; San Francisco, California; and San Antonio, Texas. Odor emissions were measured from modified and control buses at San Antonio. Records were kept of maintenance costs and of problems encountered in installation and operation.

PB-228 786/0GA PC$4.00/MF$1.45
California Univ., Berkeley. Structural Engineering Lab.
BARRIER VII: A COMPUTER PROGRAM FOR EVALUATION OF AUTOMOBILE BARRIER SYSTEMS.
Final rept. 1 Dec 70-31 May 73,
Graham H. Powell. Apr 73, 73p UCSESM-73-8
FHWA-RD-73-51
Contract CPR-11-6059

Descriptors: *Motor vehicles, *Impact tests, *Barriers, Computer programming, Highway transportation, Traffic safety, Frames, Dynamic response.
Identifiers: BARRIER 7 computer program.

The computer program BARRIER VII is described. The program analyzes the behavior of an automobile or other vehicle striking a deformable protective barrier. The program supersedes the earlier programs BARRIER IV and BARRIER V, and incorporates an energy balance computation and the ability to accommodate barriers with layers at different heights above the ground. A detailed user's guide to the program and a comprehensive example demonstrating idealization and data preparation procedures are included. A related report, 'Barrier VII: Computer Evaluation of Automobile Barrier Systems,' is to be issued by the Federal Highway Administration as Report No. FHWA-RD-73-73. Copies will be available from the National Technical Information Service.

PB-228 983/3GA PC$3.75/MF$1.45
Cleveland Transit System, Ohio.
PRE REVENUE SERVICE ACTIVITIES. AC PROPULSION PROJECT.
Interim rept.,
J. R. Pier. Sep 73, 71p UMTA-OH-06-0006-73-2
Prepared by Westinghouse Air Brake Co., Wilmerding, Pa.

Descriptors: *Rapid transit railways, *Electric propulsion, Electric railroads, AC motors, Logic circuits, Dynamic braking, Railroad cars, Urban transportation.
Identifiers: Cleveland transit system, *Retrofit.

In 1971 the Cleveland Transit System received a grant contract from the Department of Transportation's Urban Mass Transportation Administration to test, demonstrate and evaluate a solid state AC propulsion system on three rapid transit cars. The retrofit process is described and illustrated in detail. The car check-out program to verify system performance is also described and specific problems and solutions discussed. The problems and unusual difficulties encountered in the pre revenue service effort are summarized in the report. The installation of a car carried computer based data acquisition system is described and the problems encountered in this unique effort enumerated.

PB-228 987/4GA PC$4.00/MF$1.45
Cleveland Transit System, Ohio.
SINGLE CAR PERFORMANCE. AC PROPULSION PROJECT,
W. P. Cymbor, and R. D. Smith. Aug 73, 93p
UMTA-OH-06-0006-73-3
Prepared by Westinghouse Air Brake Division, Wilmerding, Pa.

Descriptors: *Electric propulsion, *Rapid transit railways, Evaluation, AC motors, Acceleration, Braking, Torque, Electric power, Consumption rate, Urban transportation, Mass transportation, Rolling stock, Railroad cars.

The report presents the testing, demonstration and evaluation of a solid state AC propulsion system on three rapid transit cars. To demonstrate general performance and applicability of the propulsion system, an on-board computer controlled data acquisition system was used to collect performance data. The data were reduced, analyzed, and plotted by computer. The description of the

general performance characteristics of the propulsion system is presented in the form of tabular listings and graphs. Some of the areas covered include rolling resistance, acceleration and braking capability, torgue output, power consumption, system efficiency, and motor temperatures.

13G. Hydraulic and Pneumatic Equipment

AD-774 842/9GA PC$3.75/MF$1.45
Harry Diamond Labs Washington D C
THE INTERPRETATION OF SURFACE STATIC PRESSURE DISTRIBUTIONS IN FLUID AMPLIFIER APPLICATIONS,
Tadeusz M. Drzewiecki. Jul 73, 52p Rept no. HDL-TR-1627

Descriptors: *Fluid amplifiers, Static pressure, Flow fields, Jet flow, Stagnation point, Fluidics, Flueric devices, Bistable devices.

The report presents a survey of basic flow fields typically found in fluid amplifiers and a summary of five fluid amplifier flow fields. The basic flow fields are presented in terms of the static pressure fields that they produce on bounding surfaces, in the form of lines of constant pressure. Formulas are given that rrquire only a knowledge of the surface pressure and the geometry of the surface to yield quantitative approximations to the velocity fields beneath the surface. Data are also presented in terms of a transition parameter for the transition to turbulence of bounded jets. Knowledge of the basic fields is used in describing the flow fields in five different fluid amplifiers, three bistable and two proportional. (Modified author abstract)

AD-775 223/1GA PC$7.50/MF$1.45
Arizona State Univ Tempe Dept of Mechanical Engineering
NOISE REDUCTION IN HYDRAULIC SYSTEMS.
Final rept.,
Earl Logan, Jr. Sep 72, 87p
Contract N00014-72-A-0070-0001

Descriptors: *Deep submergence vehicles, *Hydraulic equipment, *Noise reduction, Hydraulic pressure pumps, Piping systems, Hydraulic valves, Sound pressure, Mathematical analysis, Computer programs.

A preliminary investigation of noise in hydraulic systems was undertaken in order to determine causes and methods for reduction of noise. A method for predicting the sound pressure level associated with fluid pumping was achieved. Predictions made by this method agreed with experimental measurements made on a representative hydraulic system developed for this research. It is recommended that the calculation method be extended to include all types of pumps and piping arrangements found in hydraulic systems and that the experimental apparatus be modified to further test predicted results. (Author)

N74-14959/2GA PC$3.00/MF$1.45
Pennsylvania State Univ., University Park. Systems and Controls Lab.
FLUIDICS RESEARCH, INCLUDING VORTEX AND JET PIPE VALVES.
Jul 73, 14p NASA-CR-13653, PSU-SCL-16(73A)
Contracts NGR-39-009-023, DAAG39-72-C-0190

Descriptors: *Fluid amplifiers, *Fluidics, Mathematical models, Research and development, University program.

For abstract, see STAR 1206

13H. Industrial Processes

AD-774 933/6GA PC$3.75/MF$1.45
Martin Marietta Corp Baltimore Md Research Inst for Advanced Studies
ELECTROMECHANICAL MACHINING.
Technical rept.,
R. M. Latanision, and K. C. Nielsen. May 73, 67p* RIA-R-RRT-6-35-73
Contract DAAF03-72-C-0074

Descriptors: *Machining, Electrochemistry, Friction, Thermoelectricity, Control, Hardness, Nickel, Nickel alloys.
Identifiers: *Electromechanical machining, Nickel alloy Hastelloy X.

The purpose of this investigation was to determine the feasibility of using a new metal cutting process called electromechanical machining in which metal is cut by direct contact of the tool with an electrochemically polarized workpiece. In this process, electrochemical polarization of the workpiece effectively controls the coefficient of friction, between the tool and the workpiece, and the rate of work hardening. Thermoelectric compensation was also used to reduce cutting tool wear while simultaneously investigating electromechanical machining. Electromechanical machining was used in laboratory experiments with polycrystalline nickel and Hastelloy X workpieces. The workpieces were totally submerged in an electrolyte, and a 7-inch shaper was instrumented with strain gages so that forces required in cutting at various electrode potentials could be determined from the tool deflection. (Modified author abstract)

AD-775 096/1GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
HEAT TREATMENT OF WELDS IN STAINLESS STEEL,
G. F. Golovin, and E. P. Evangulova. 31 Jan 74, 17p Rept no. FTD-HT-23-257-74
Edited trans. of Promyshlennoe Primenenie Tokov Vysokoi Chastoty. Trudy (USSR) n11 p106-116 1970, by Dean F. W. Koolbeck.

Descriptors: *Stainless steel, *Heat treatment, *Welds, Induction heating, Translations, USSR.

The study of the possibility of using rapid induction heating for heat treatment of welds in stainless steels of the martensite (4Kh13, 3Kh13) and ferrite (0Kh17T and 0Kh25T) classes was carried out with specimens cut from 2 and 4 mm strip.

AD-775 116/7GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
TRANSFER OF INFORMATION WITHIN LOCAL INTRAINDUSTRIAL AUTOMATED PLANNING SYSTEM,
N. Ya. Karachentseva. 31 Jan 74, 18p Rept no. FTD-HT-23-391-74
Edited trans. of Vychislitelnaya Tekhnika v Mashinostroenii (USSR) p129-138 Sep 70, by Marilyn Olaechea.

Descriptors: *Production engineering, *Data processing, Automation, Production control, Information processing, Industries, Planning, Translations, USSR.

The basic features of a local intraindustrial planning system are determined and practical recommendations are made for developing and planning methods of transferring information in a (Data Computer System for Automatic Process Planning). (Author)

AD-775 131/6GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
ADVANTAGES OF STANDARDIZATION,
G. Plashey, and N. Margolin. 17 Jan 74, 8p Rept no. FTD-HT-23-905-74
Edited trans. of Sotsialisticheskaya Industriya (USSR) n182 p2, 5 Aug 73, by Charles T. Ostertag, Jr.

Descriptors: *Production engineering, Standardization, Production, Automation, Translations, USSR.

AD-775 147/2GA PC$10.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
TECHNOLOGICAL EFFECTIVENESS OF STRUCTURES. CHAPTERS VIII AND IX,
S. L. Anan'yevaeva, and V. P. Kuprovicha. 31 Jan 74, 138p Rept no. FTD-MT-24-769-73
Edited machine trans. of mono. Spravochnoe Posobie Tekhnologichnost Konstruktsii, n.p., 1969 p234-320, by Robert Allen Potts.

Descriptors: *Mechanical working, Forging, Cold working, Billets, Fabrication, Manufacturing, Translations, USSR.

Contents:
The manufacturability of billets obtained by hot plastic deformation;
Manufacturability of cold-stamped parts.

COO-3466-9 PC$3.00/MF$1.45
Rensselaer Polytechnic Inst., Troy, N.Y. (Usa).
RESEARCH IN POWDER METALLURGY. FINAL REPORT.
F. V. Lenel. Aug 73, 15p
Contract AT(11-1)-3466

Descriptors: (*Sintering, *Research programs), Dislocations, Ionic crystals, Mass transfer, Metals, Reaction kinetics.

For abstract, see NSA 29 05, number 10661.

HEDL-SA-664 PC$3.75/MF$1.45
Hanford Engineering Development Lab., Richland, Wash. (Usa).
CONSIDERATION ON LIMITS OF COLD WORKING IN NUCLEAR CONSTRUCTION.
R. A. Moen, and G. V. Smith. 1973, 32p
Contract AT(45-1)-2170

Descriptors: (*Stainless steels, *Cold working), Austenite, Lmfbr type reactors, Mechanical properties, Reactor materials, Specifications, Strains, Stresses.

For abstract, see NSA 29 05, number 10662.

N74-15133/3GA PC$3.00/MF$1.45
National Aeronautical Lab., Bangalore (India).
RELATIONSHIP BETWEEN THERMOVOLTAGE AND SINTERING PROCESS.
G. Ritzau. Nov 73, 14p NAL-TR-190
Tran-Transl. Into English from Sonderdruck Aus den Planseeberichten, V. 8, No. 3.

Descriptors: *Electric potential, *Phase transformations, *Powder metallurgy, *Sintering, Thermal stresses, Visual observation.

For abstract, see STAR 1206

N74-15183/8GA PC$3.50/MF$1.45
National Aeronautical Lab., Bangalore (India). Propulsion Div.
DISPERSION HARDENING IN POWDER METALLURGY.
W. Schatt. 1972, 28p NAL-TR-128
Tran-Transl. Into English from Neue Hutte (Dresden), V. 2, Feb. 1970.

Descriptors: *Deformation, *Metals, *Powder metallurgy, *Precipitation hardening, Creep properties, High temperature, Recrystallization.

For abstract, see STAR 1206

PATENT-3 705 091 Not available NTIS
Department of the Interior, Washington, D.C.
METHOD OF SEPARATING LIQUID-SOLID SUSPENSIONS INTO INDIVIDUAL PHASES.
Patent,
George A. Brady, and Harold H. Griffiths. Filed 20 Apr 65, patented 21 Feb 67, 3p PAT-APPL-449 657, DOCKET/MIN-734
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Dewatering, *Coal preparation, *Patents, Slurries, Separators.
Identifiers: PAT-CL-210-65.

This invention relates to a novel method for separating mixtures of liquids and solids into individual phases. The system is particularly concerned with the dewatering of coal by feeding a solid-liquid slurry to an atomizing device operated so as to convert the water into droplets smaller than the coal particles and injecting the coal and fine water particles into a gaseous separating stream, such as air.

PATENT-3 676 052 Not available NTIS
Department of Agriculture, Washington, D.C.
POLYPROPYLENE GLYCOLS AND SUBSTITUTED POLYPROPYLENE GLYCOLS ARE USED IN CONJUNCTION WITH CROSSLINKING AGENCY TO PRODUCE DURABLE PRESS FABRICS WITH IMPROVED SOIL RELEASE PERFORMANCE.
Patent,
Robert J. Harper, Jr., Joseph S. Bruno, and Gloria A. Gautreaux. Filed 3 Nov 69, patented 11 Jul 72, 5p PAT-APPL-873 703,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Textile finishing, *Durable press treating, *Wash wear treating, Crosslinking, Cotton fabrics, Curing, Polyoxypropylene.
Identifiers: Soiling, Washability, PAT-CL-008-120-000.

This invention relates to fabrics treated with one bath systems containing crosslinking agents and polypropylene alcohols, glycols and polyols. These treatments once applied to fabrics produce fabrics with wash-wear and durable press performance and which have improved soil release characteristics. This provides garments for the consumer with better washability characteristics. These treatments are most effective on all-cotton fabrics but they may also be applied to polyester-cotton blends. The system used to achieve soil-release is a one bath system readily applicable to either precured or postcured fabrics. These treatments have been evaluated using soiling tests followed by laundering and measuring reflectance values.

PATENT-3 701 626 Not available NTIS
Department of Agriculture, Washington, D.C.
PROCESS FOR RENDERING CELLULOSICS WATER-AND OIL-REPELLENT.
Patent,
Samuel E. Ellzey, Jr., William J. Connick, Jr., Wilson A. Reeves, and George L. Drake, Jr. Filed 23 Dec 70, patented 31 Oct 72, 4p PAT-APPL-101 131,
Previously filed as PAT-APPL-883 624, 9 Dec 69.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Textile finishing, *Cellulosic resins, *Waterproofing, Fluorine aliphatic compounds, Amines, Chemical reactions, Stains.
Identifiers: *Phosphonium compounds, *Stain resistance, PAT-CL-008-115-500.

An object of this invention is to provide a process whereby cellulosic materials are rendered highly oil-repellent and slightly water-repellent. As a consequence of being rendered oil- and water-repellent, the cellulosic materials are rendered more resistant to staining by water-, but more particularly by oil-borne stains. The reaction product of tetrakis(Hydroxymethyl)phosphonium salts and primary 1,1-dihydroperfluoroalkylamines, when applied from aqueous emulsions, renders cellulosic materials repellent to oil and water and increases their resistance to staining by oily materials.

PATENT-3 724 243 Not available NTIS
Department of Agriculture, Washington, D.C.
CHAINLESS MERCERIZER SUITABLE FOR USE WITH LIQUID AMMONIA.
Patent,
Timothy A. Calamari, Jr., Sidney P. Schreiber, Albert S. Cooper, Jr., and Wilson A. Reeves. Filed 7 May 71, patented 3 Apr 73, 7p PAT-APPL-141 353,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Textile finishing, *Mercerizing, Rollers.
Identifiers: PAT-CL-068-244.

It is the object of this invention to incorporate graduated driven rollers of increasing diameter into a device of the prior art such that each driven roller becomes incrementally larger than the previous one in the direction of fabric travel. The increase in diameter of the rollers will be governed by the type fabric being mercerized, the mercerizing agent, and the operating conditions. After removal of the mercerizing agent, the fabric is removed from the machine.

13I. Machinery and Tools

N74-15132/5GA PC$3.75/MF$1.45
Technion - Israel Inst. of Tech., Haifa. Dept. of Aeronautical Engineering.
ANALYSIS OF SHORT JOURNAL BEARINGS WITH NEW BOUNDARY CONDITIONS.
I. Etsion, and O. Pinkus. Sep 72, 35p TAE-161

Descriptors: *Journal bearings, *Lubricants, *Reynolds equation, Hydrodynamics, Independent variables, Performance, Sommerfeld approximation.

For abstract, see STAR 1206

N74-15136/6GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
BALL MOTION AND SLIDING FRICTION IN AN ARCHED OUTER-RACE BALL BEARING.
B. J. Hamrock. Jan 74, 46p NASA-TN-D-7448, E-7607

Descriptors: *Ball bearings, *Sliding friction, Dynamic characteristics, Fatigue life, Lubrication, Thrust loads.

For abstract, see STAR 1206

PATENT-3 108 716 Not available NTIS
Department of the Interior, Washington, D.C.
PRESSURE CONTROL MECHANISM.
Patent,
Louis A. Panck, and John A. Stock. Filed 15 Sep 61, patented 29 Oct 63, 5p PAT-APPL-138 532, DOCKET/MIN-472
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Pressure regulators, *Patents, Mines(Excavations), Pressure measurement, Hydraulic equipment, Pressure control.

The invention relates to a portable hand-operated mechanical device for pumping fluids under high pressure and simultaneously metering the volume of fluid pumped.

PATENT-3 162 257 Not available NTIS
Department of the Interior, Washington, D.C.
BARREL-TYPE SOIL AUGER.
Patent,
Newton E. Noyes. Filed 12 Oct 62, patented 22 Dec 64, 2p PAT-APPL-230 298,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Augers, *Patents, Soils, Sampling, Coring bits, Coring.
Identifiers: PAT-CL-175-403.

The invention relates to a soil auger for obtaining soil samples, and more particularly to a hand or power operated barrel-type soil auger for obtaining soil samples in an expeditious and improved manner.

PATENT-3 337 889 Not available NTIS
Department of the Interior, Washington, D.C.
MECHANICAL DEVICE FOR CLEANING THE INTERIOR OF LARGE AQUARIUM TANKS.
Patent,
Walter L. West. Filed 11 Mar 66, patented 29 Aug 67, 7p PAT-APPL-535 308,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Cleaning, *Patents, Mechanical components, Brushes, Water tanks, Glass.
Identifiers: PAT-CL-15-1-7.

The patent describes a remotely controlled casing which moves along and cleans submerged interior surfaces of large aquarium tanks. It involves detergent washing, brushing and suction action.

PATENT-3 464 502 Not available NTIS
Department of the Interior, Washington, D.C.
HYDRAULIC-DRIVE DRILLING.
Patent,
Robert W. Ageton. Filed 6 Nov 67, patented 2 Sep 69, 9p PAT-APPL-680 616, DOCKET/MIN-756
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Drills, *Patents, Hydraulic motors, Coring, Quartzites, Hydraulic control.
Identifiers: PAT-CL-173-20.

The patent relates to drilling cores of hard, fractured quartzite, accomplished by separately applying sensitiveiy controlled high pressure hydraulic forces to rotate and advance a drill. Applicable drilling apparatus includes a gear drive housing which is attached to a centrally supported torque guide tube, and supports a bit chuck for a rotational drive by a hydraulic motor and longitudinally displacement by hydraulically driven pistons affixed to the housing. Independently controlled hydraulic pressure circuits variably activate the pistons and produce high torque at low r.p.m.'s in the motor. A console adjacent the pressure controls contains instrumentation allowing concurrent observations of all important operational parameters during controlled drilling.

PATENT-3 696 603 Not available NTIS
Department of Agriculture, Washington, D.C.
ELECTROSTATIC FIBER COLLECTING AND YARN SPINNING APPARATUS.
Patent,
James I. Kotter, Harold L. Salaun, Jr., and Roger S. Brown. Filed 12 Apr 71, patented 10 Oct 72, 9p PAT-APPL-132 952,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Spinning frames, *Patents, Yarns, Spinning(Stable fibers), Concentrators.
Identifiers: PAT-CL-057-058-890.

The patent describes a method of using the combination and interaction of electrostatic and mechanical forces. Airborne opened fibers are transported, parallelized, collected en masse and twisted to continuously form a high quality textile yarn. The invention also relates to a method and apparatus for continuous formation of a variety of yarns from the basic fiber spinning apparatus.

PATENT-3 747 558 Not available NTIS
Department of the Air Force Washington D C
CROSS-MOUNTED MASK CHANGER WITH THICKNESS MONITORING.
Patent,
Abraham Harel. Filed 3 Nov 72, patented 24 Jul 73, 8p Rept nos. PAT-APPL-303 437,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Masking, *Patents, Industrial equipment, Vapor deposition, Monitors, Positioning devices(Machinery).
Identifiers: PAT-CL-118-8.

The patent relates to a mask changer mounted in vacuum in a glass cross and, more particularly, to an automatically cycled and monitored device for vapor deposit of metal vapor or other evaporable material on a substrate surface that is partially and sequentially masked to establish a desired conductivity pattern.

PATENT-3 781 958 Not available NTIS
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
METHOD OF MAKING ROLLING ELEMENT BEARINGS.
Patent.
R. J. Parker. Patented 1 Jan 74, 4p NASA-CASE-LEW-11087-2,
Misc-Filed 14 Aug. 1972 Supersedes N72-31491 (10 - 22, p 2971). Subm-Continuation-in-Part of US Patent Appl. Sn-201904, Filed 24 Nov. 1971.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Cores, *Roller bearings, Cavities, Density (Mass/volume), *Patents, Surface properties.

A method is described of making rolling elements by forming low mass cores having either hollow centers or being of a low mass material. The low mass cores are plated and heat treated to provide hard surfaces on the rolling elements. After grinding to the proper diameter the rolling elements are assembled between races to form a hearing.

13J. Marine Engineering

AD-774 806/4GA PC$3.25/MF$1.45
Army Mobility Equipment Research and Development Center Fort Belvoir Va
EXPLOSIVE EMBEDMENT ANCHORS FOR SHIP MOORING.
Interim rept. 1958-1972,
Henry C. Mayo. Nov 73, 39p Rept no. USAMERDC-2078

Descriptors: *Mooring, *Ships, *Anchors(Marine), *Explosive actuators, Embedding, Penetration, Creep, Subsurface, Ocean bottom soils, Sediments, Tankers, Offshore, Installation, Test methods.
Identifiers: M-50 ANCHORS, M-200 ANCHORS, Explosive embedment anchors, Ship mooring.

A 50,000-pound nominal capacity (XM-50) explosive embedment anchor and a 200,000-pound nominal capacity (XM-200) explosive embedment anchor have been designed and tested by the Army for application in ship mooring. Tests include determinations of anchor penetration, ultimate holding capacity and short-term creep in most subbottom sediments except rock. Full scale mooring tests of a T-5 tanker and a Navy LST ship have been accomplished successfully. Test results have been incorporated in optimizing the anchors' physical configuration and installing procedure. It is concluded that the two sizes of explosive anchors offer installing and operational advantages for ship mooring compared to conventional fluked anchors. Testing to date indicates that the explosive anchors will perform satisfactorily for ship mooring provided they are installed properly. (Author)

AD-774 940/1GA PC$3.75/MF$1.45
Massachusetts Inst of Tech Cambridge Dept of Ocean Engineering
SHIP SYSTEM STUDIES. APPROACHES TO ARRANGEMENT DESIGN IN NAVAL SHIP CONCEPT DEVELOPMENT,
E. Frankel. Nov 73, 75p Rept no. OE-74-4
Contract N00014-67-A-0204-0011

Descriptors: *Naval vessels, Ship structural components, Shipboard, Compartments, Experimental design, Optimization, Network flows.
Identifiers: *Design improvement, *Space allocation, GERT(Graphical Evaluation and Review Techniques), Graphical evaluation and review techniques.

A review of the naval ship concept design development process is presented and methods for modeling the design process and improve convergence in the iterative design sequence are discussed. The use of GERT type network techniques for modeling the design process and determining improvements in design convergence, as well as in design process time and cost is advocated. Design optimization is always subject to uncertainty in the performance weighing of component systems as well as risk in their actual performance to design criteria. Methods for design optimization under risk are reviewed. (Modified author abstract)

AD-774 994/8GA PC$4.00/MF$1.45
Southwest Research Inst San Antonio Tex
A GENERAL THEORY OF UNSTEADY LOADS ON CAVITATING HYDROFOILS.
Final rept. 15 Nov 71-15 Dec 73,
James F. Unruh, and Robert L. Bass. Dec 73, 84p
Contract N00014-72-C-0075

Descriptors: *Hydrofoils, Cavitation, Hydrodynamics, Loads(Forces), Vortices, Aspect ratio, Fluid flow.

A general numerical approach using a doublet lattice-source representation for the prediction of unsteady loads on cavitating, general planform, finite aspect ratio hydrofoils is presented. Results for both super and partial cavitating foils of high aspect ratio are compared to the two-dimensional results of Woods and exhibit excellent agreement. Low aspect ratio results compare favorably with existing numerical approaches for supercavitating foils. Additional results for partially cavitating low aspect ratio foils are also presented. (Author)

AD-774 998/9GA PC$4.00/MF$1.45
Woods Hole Oceanographic Institution Mass
ADVANCED MARINE TECHNOLOGY.
Technical progress rept. 1 Feb-31 Jul 73,
A. E. Maxwell, Robert D. Ballard, Raymond E. Davis, Andrew H. Eliason, and Frederick R. Hess. 1 Dec 73, 98p Rept no. WHOI-73-92
Contract N00014-71-C-0284
Sponsored in part by Advanced Research Projects Agency, Washington, D.C. See also AD-763 372.

Descriptors: *Submersibles, *Marine geophysics, *Ocean bottom sampling, Underwater vehicles, Underwater tools, Drills, Hammers, Underwater navigation, Underwater sound.
Identifiers: SCAMP(Self Contained Ancillary Modular Platform), Self contained ancillary modular platform,Q, Alvin vessel, Deep sea rock drills.

The report is a progress report for the period 1 February 1973 - 31 July 1973 on the following projects in Advanced Marine Technology: submerged navigation, hydraulic impact hammer, self contained deep sea rock drill, self contained ancillary modular platform, and modular acoustic system. (Author)

AD-775 016/9GA PC$8.00/MF$1.45
Naval Postgraduate School Monterey Calif
DATA REDUCTION SYSTEM FOR THE XR-3 CAPTURED AIR BUBBLE TESTCRAFT.
Master's thesis,
Peter Vincent Dabbieri, Jr. Dec 73, 98p

Descriptors: *Ships, *Air cushion vehicles, Data acquisition, Data reduction, Curve fitting, Least squares method, Data processing, Analog to digital converters, Logic circuits, Theses, Signal processing.
Identifiers: R-3 vessel, XR-3 vessel, CAB(Captured Air Bubbles), Captured air bubbles.

A fast, accurate and portable data reduction system was developed for the XR-3 Captured Air Bubble testcraft being evaluated at the Naval Postgraduate School, Monterey, California. The system consists of four units. A magnetic tape recorder is used for data play back. A signal conditioner unit with a built-in analog-to-digital converter was developed and is used to filter, amplify, sum and further prepare the data for transmission to either a strip chart recorder or a digital X-Y plotter through a Monroe 1880 calculator. (Modified author abstract)

AD-775 040/9GA PC$8.25/MF$1.45
Naval Postgraduate School Monterey Calif
DESIGN ON THE FREQUENCY PARAMETER PLANE WITH APPLICATION TO ROLL STABILIZATION OF SHIP.
Master's thesis,
Manop Vachanaratana. Dec 73, 104p

Descriptors: *Ships, *Stabilization systems, Roll, Water tanks, Feedback, Closed loop systems, Transfer functions, Theses.

Frequency parameter plane techniques are developed for the analysis and synthesis of both linear and nonlinear systems. The transmission function of a dynamic system contains two parameters which are adjusted to provide desired performance. These parameters represent elements of the system. The four dimensional parameter space relating magnitude, frequency, and the two parameters may be represented by seven two dimensional projections of the parametric curves. Computer programs are developed for the computation, and graphs of results are obtained. Interpretations of the graphs can be used for design of systems such as tank stabi'izers. (Author)

AD-775 228/0GA PC$6.00/MF$1.45
General Electric Co Schenectady N Y Research and Development Center
CRYOGENIC SYSTEMS AND SUPERCONDUCTIVE POWER.
Semiannual technical rept. no. 2, 1 Dec 72-30 Sep 73,
B. D. Hatch, R. B. Fleming, D. W. Jones, D. L. Kerr, and S. H. Minnich. 1 Oct 73, 240p Rept no. SRD-73-139
Contract DAHC15-72-C-0235, ARPA Order-2200
See also AD-758 431.

Descriptors: *Marine propulsion, *Refrigeration systems, *Cryogenics, *Superconductors, Electric propulsion, Electrical equipment, Coils, Turbogenerators, Generators, Alternators, Bearings, Systems engineering, Liquid metals.
Identifiers: *Turborefrigerators, Turboalternators.

The report defines, investigates, and experimentally evaluates the key elements of a representative crogenic turborefrigerator subsystem suitable for providing reliable long-lived cryogenic refrigeration for a superconductive ship propulsion system. (Modified author abstract)

AD-775 255/3GA PC$3.25/MF$1.45
Scripps Institution of Oceanography La Jolla Calif Advanced Ocean Engineering Lab
SEAWATER ABSORPTION BY PRECAST PORTLAND CEMENT CONCRETE CONTAINING LIGHTWEIGHT AGGREGATE,
William R. Lorman. Nov 73, 50p Rept nos. AOEL-54, SIO-Ref-73-41
Contract N00014-69-A-0200-6012, ARPA Order-1348

Descriptors: *Platforms, *Offshore, *Concrete, *Floating bodies, *Absorption, *Sea water, Density.

The purpose of this investigation was to determine the bulk specific gravity of, and the percentage of seawater absorbed by, three precast lightweight concretes as a consequence of extended submersion in 66F seawater at simulated oceanic depths of 1 ft, 40 ft, and 350 ft (respectively, nearly 0 psi, 18 psi, and 155 psi hydrostatic).

AD-775 329/6GA PC$6.50/MF$1.45
Boeing Co Seattle Wash Naval Systems Div
TRADE-OFF STUDY FOR MATERIALS AND FABRICATION PROCESSES FOR ADVANCED HIGH PERFORMANCE SHIP APPLICATIONS. VOLUME II. APPENDICES.
Final rept. 15 Jun 73-28 Feb 74,
Thomas J. Bosworth. Feb 74, 253p Rept no. D180-17941-1-Vol-2
Contract N00024-73-C-5506
See also Volume 1, AD-775 330.

Descriptors: *Ships, Trade off analyses, Materials, Fabrication, Hydrofoil craft, Surface effect ships, Air cushion vehicles, Aluminum alloys, Titanium alloys, Steel, Nickel alloys, Cost analysis, Costs.
Identifiers: Manufacturing, High performance.

Contents: Candidate structural materials; Process ratings for materials; Cost analysis; Performance (design) analysis; Risk assessment; Shipyard capabilities; and, Annotated bibliography of selected references.

AD-775 330/4GA PC$7.50/MF$1.45
Boeing Co Seattle Wash Naval Systems Div
TRADE-OFF STUDY FOR MATERIALS AND FABRICATION PROCESSES FOR ADVANCED HIGH PERFORMANCE SHIP APPLICATIONS. VOLUME I.
Final rept. 15 Jun 73-28 Feb 74,
Thomas J. Bosworth. Feb 74, 235p* Rept no. D180-17941-1-Vol-1
Contract N00024-73-C-5506
See also Volume 2, AD-775 329.

Descriptors: *Ships, Trade off analyses, Materials, Fabrication, Hydrofoil craft, Surface effect ships, Air cushion vehicles, Missions, Coatings, Nondestructive testing, Ship decks, Ship hulls, Hydrofoils, Cost analysis.
Identifiers: Manufacturing, *High performance ships.

The objectives of the study were to: Identify the mission and system criteria for major structural systems for advanced ships; establish guidelines for the selection of materials and processes for high performance ships; conduct trade studies of candidate materials and fabrication processes to evaluate their cost effectiveness and practicality; and, make recommendations for future effort required to fill data voids identified by this study and a plan to accomplish that work. The output of the study includes (1) a list of mission and system criteria that need to be identified prior to the material/fabrication concept selection, (2) a set of guidelines for the selection of material/fabrication concepts applicable to specific mission, system and design criteria, (3) a collection of applicable material and process data, (4) procedures for establishing a fabricability index and a cost index for materials, (5) three trade studies on representative structures, and (6) recommendations for future work. (Modified author abstract)

AD-775 338/7GA PC$3.75/MF$1.45
Stevens Inst of Tech Hoboken N J Davidson Lab
SHIP MANEUVERING PERFORMANCE WITH VARIOUS DEGREES OF DYNAMIC COURSE STABILITY.
Final rept.,
Haruzo Eda. Aug 73, 56p Rept no. SIT-DL-73-1655
Contract N00014-67-A-0202-0029

Descriptors: *Tankers, *Seakeeping, Ship motion, Sea states, Ocean waves, Dynamics, Stability, Maneuverability, Mathematical models.

Results are given of analytical studies to evaluate the effect of inherent dynamic course stability on ship performance in an effort to indicate guidelines to acceptable degrees of instability. Eigenvalue analysis and nonlinear trajectory analysis were applied to examine the performance of three ships having various degrees of stability. To ensure a realistic representation of a ship dynamic system, previously obtained captive model test results were used. A summary chart was made to indicate the directionally stable region for these ships. A ship with a large degree of inherent instability requires a large value of yaw-rate gain to achieve directional stability. This can cause difficulties in ship handling. Motion predictions in zig-zag and spiral maneuvers indicate that a very unstable ship has a tendency to divert from the straight course, having a large overshoot in heading change. (Modified author abstract)

AD-775 494/8GA PC$4.50/MF$1.45
Army War Coll Carlisle Barracks Pa
THE MILITARY IMPLICATIONS OF THE SUPER TANKER AND THE PROPOSED SUPER CARGO SHIP.
Student essay,
Ralph S. Treadwell. 5 Sep 70, 30p

Descriptors: *Tankers, *Barges, Military requirements, Logistics.

The essay considers the economic feasibility of super tankers and super cargo ships to fulfill military requirements. In addition, the capabilities and limitations of these vessels are weighed against smaller, more conventional vessels. Conclusions based upon current trends, indicate that the super tanker will play a limited roll in future military operations; however, the super cargo ship (in the form of a giant barge ship) may very well meet many future military logistical requirements. (Author)

AD-775 570/5GA PC$4.50/MF$1.45
Army War Coll Carlisle Barracks Pa
REVITALIZATION OF THE AMERICAN MERCHANT MARINE.
Student essay,
Donal L. Turkal. 1 Oct 70, 30p

Descriptors: *Merchant vessels, Shipbuilding, Legislation.
Identifiers: International trade.

The essay reviews the history of the deficiencies in the American Merchant Marine, and examines proposed programs of the President to note the benefits from an increased activity in U.S. shipbuilding. (Modified author abstract)

COM-74-10424/1GA PC$14.50/MF$1.45
Wartsila Icebreaking Model Basin, Helsinki (Finland).
GREAT LAKES ORE CARRIER SERIES - ICE RESISTANCE MODEL TEST PROGRAM IN LOADED CONDITION.
Final rept. fiscal year 1973,
Bengt M. Johansson, and Eero Makinen. 29 Dec 72, 229p WIMB-Test-18 MA-RD-900-73042
Contract MA-1-35502
See also COM-74-10425.

Descriptors: *Great Lakes, *Cargo ships, *Ice navigation, Waterway transportation, Ship hulls, Design criteria, Ice, Ship models, Finland.

The object of the model test program was to provide the ship designer with the methodology for designing ships to operate in ice waters. The methodology is to include quantitative relationships between ship form parameters, ice conditions, ship motion and ice resistance for Great Lakes vessel operations in the extended season. The program consisted of the comprehensive testing of nine models of varying bow form, length and beam. The final result is a method for calculating ice resistance in different ice thicknesses and at different speeds for ships with forms similar to those of Great Lakes ore carriers.

COM-74-10425/8GA PC$10.50/MF$1.45
Wartsila Icebreaking Model Basin, Helsinki (Finland).
GREAT LAKES ORE CARRIER SERIES - ICE RESISTANCE MODEL TESTS IN BALLAST CONDITIONS.
Final rept. fiscal year 1973,
Asko Laine, Bengt M. Johansson, and Eero Makinen. 25 Sep 73, 148p WIMB-Test-24 MA-RD-900-74031
Contract MA-1-35502
See also COM-74-10424.

Descriptors: *Great Lakes, *Cargo ships, *Ice navigation, Waterway transportation, Ship hulls, Design criteria, Ice, Ship models, Finland.

The object of the model test program was to provide the ship designer with the methodology for designing ships to operate in ice waters. The methodology is to include quantitative relationships between ship form parameters, ice conditions, ship motion and ice resistance for Great Lakes vessel operations in the extended season. The program consisted of the comprehensive testing of nine models of varying bow form, length and beam. The final result is a method for calculating ice resistance in different ice thicknesses and at different speeds for ships with forms similar to those of Great Lakes ore carriers.

13K. Pumps, Filters, Pipes, Fittings, Tubing and Valves

PATENT-3 854 243 Not available NTIS
Department of the Interior, Washington, D.C.
HIGH TEMPERATURE ELECTROSTATIC PRECIPITATOR AND METHOD OF OPERATION.
Patent,
Walter S. Bowie. Filed 16 Sep 60, patented 18 Sep 62, 5p PAT-APPL-56 607, DOCKET/MIN-395
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Electrostatic precipitators, Design, Cathodes, Cooling.
Identifiers: PAT-CL-55-11.

The invention relates to the removal of particulate matter from gases by electrically imposing a negative or positive charge on the particulates and subjecting them to an opposing polarity sufficient to attract and hold them, thereby removing them from the gas stream. The invention is an improvement on the present commercially available electrostatic precipitators, and is applicable to both plate and pipe type equipment. More particularly, the invention involves means to permit a more ef-

ficient removal of suspended particles in gases at elevated temperatures.

PATENT-3 482 374 Not available NTIS
Department of the Interior, Washington, D.C.
PROCESS FOR ELECTROSTATIC PRECIPITATION.
Patent,
Correll C. Shale. Filed 3 Oct 67, patented 9 Dec 69, 5p PAT-APPL-672 647, DOCKET/MIN-914
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Electrostatic precipitators, *Patents, Gases, Electrodes.
Identifiers: PAT-CL-55-2, Air pollution control equipment.

In the patent electrostatic precipitation of particulate matter from gas streams above about 1200F. and at low intermediate pressures is accomplished by providing a collecting electrode to emitting electrode effective diameter ratio of less than about 50.

13L. Safety Engineering

AD-774 920/3GA PC$3.75/MF$1.45
Manned Systems Sciences Inc Northridge Calif
TRAINING EFFECTIVENESS EVALUATION OF A PROTOTYPE WATER-SPRAY SMOKE ABATEMENT SYSTEM FOR FIRE FIGHTING TRAINING.
Final rept. Apr-Nov 72,
Clarence A. Semple, Jr. Nov 73, 59p*
NAVTRAEQUIPC-72-C-0209-1
Contract N61339-72-C-0209

Descriptors: *Fire fighting, *Naval training, *Ship fires, Naval personnel, Proficiency, Smoke abatement, Fuel oil, Simulation.
Identifiers: *Engine room fires.

A study was performed to compare the training effectiveness of natural and smoke-abated simulated engine room fires through the use of objective measures of student performance augmented by student and instructor opinions. Two groups of Fire Fighting School students were trained and tested. One group received training on natural fires, followed by one natural and one smoke-abated criterion test fire. The second group received training on smoke-abated fires, followed by one natural and one smoke-abated criterion test fire. Student error data were collected during all fires. Opinion data were collected at the conclusion of test fires. (Modified author abstract)

AD-775 304/9GA PC$3.25/MF$1.45
National Aviation Facilities Experimental Center Atlantic City N J
THE FEASIBILITY OF DETECTING A BURNER-CAN BURN-THROUGH BY MEANS OF CO, CO2, PRESSURE, AND AIR TEMPERATURE LEVELS IN A JET ENGINE NACELLE.
Final rept. Jan 72-Jul 73,
Richard Hill. Mar 74, 27p Rept no. FAA-NA-73-110 FAA-RD-74-18

Descriptors: *Aircraft fires, *Jet engine nacelles, Fire detectors, Jet engines, Burners, Burnthrough, Carbon monoxide, Carbon dioxide, Detection, Feasibility studies.
Identifiers: J-57 engines.

Full-scale tests simulating engine combustion section thermal failure (burn-through) were conducted using a cowled J-57 engine to determine the feasibility of detecting a burn-through by monitoring the carbon monoxide (CO), carbon dioxide (CO2), a pressure level, or air temperature in the nacelle before, during, and after engine case rupture. Results of the tests indicated that CO, CO2, pressure, and air temperature in the nacelle cannot be relied upon for early detection of a burn-through. Test results also indicated that containment of a burn-through flame in the nacelle creates extremely high temperatures in the nacelle and can cause extensive structural damage. (Author)

AERE-R-5514 PC$4.75/MF$1.45
Ukaea Research Group, Harwell. Atomic Energy Research Establishment.
SOLVENT FIRES AND EXPLOSIONS IN GLOVE BOXES: INVESTIGATION TO DETERMINE MINIMUM HAZARDOUS QUANTITY.
F. J. May. Oct 73, 55p
U.S. Sales Only.

Descriptors: (*Gloveboxes, *Explosions), Fire hazards, Fires, Safety, Solvents.

For abstract, see NSA 29 05, number 10112.

COM-74-10478/7GA PC$5.25/MF$1.45
National Bureau of Standards, Washington, D.C. Inst. for Applied Technology.
A MODEL CORRIDOR FOR THE STUDY OF THE FLAMMABILITY OF FLOOR COVERINGS.
Final rept.,
James W. Raines, and Wells Denyes. May 73, 41p NBSIR-73-200
Prepared in cooperation with Man-Made Fiber Producers Association, Inc., Washington, D.C.

Descriptors: *Floor coverings, *Flammability, *Test facilities, *Fire tests, Flame propagation, Air flow, Data acquisition, Ducts, Detectors, Electronic test equipment, Ignition.
Identifiers: Repeatability.

A program was carried out to develop a laboratory test method that would measure the flame propagation characteristics of floor covering materials. A facility was designed which included a floor mounted specimen in a rectangular cross-sectional duct having a forced supply of air and a gas burner ignition source. The effects of variations in duct size, ignition source, and air flow were studied. Factors influencing repeatable test results were explored. Flame spread was measured by an observer, and temperature and heat flux measurements were recorded on an electronic digital data acquisition system.

PB-228 785/2GA PC$7.50/MF$1.45
National Highway Traffic Safety Administration, Washington, D.C. Office of Accident Investigation and Data Analysis.
MULTIDISCIPLINARY ACCIDENT INVESTIGATION SUMMARIES. VOLUME 4, NUMBER 10.
Nov 73, 327p DOT-HS-601 654
See also Volume 4, number 9, PB-227 131.

Descriptors: *Motor vehicle accidents, *Accident investigations, Collision research, Human factors engineering, Automobiles, Highways, Design standards, Safety devices, Traffic safety.

The report contains case summaries of recent in-depth reports submitted by the National Highway Traffic Safety Administration sponsored Multidisciplinary Accident Investigation Teams in a continuing series of publications. Accidents are studied involving vehicles of the last three model years of fatal, injury producing, or property damage severity. The Teams investigate the accidents in-depth concerning themselves with each element of the collision (human, vehicle, environment) as it interacts with each phase of the collision (pre-crash, crash, post-crash). The summaries consist of identification information, basic information on the highway and vehicles involved, a description of the drivers and occupants with their injuries, a phase-by-phase description of the sequence of events of the collision, and a list of the causal factors, conclusions and recommendations. A diagram of each collision is included.

13M. Structural Engineering

AD-774 847/8GA PC$3.75/MF$1.45
Army Construction Engineering Research Lab Champaign Ill
NONDESTRUCTIVE TESTING OF CONSTRUCTION MATERIALS AND OPERATIONS.
Final rept.,
George W. Sevall, Jr. Dec 73, 68p* Rept no. CERL-TR-M-67

Descriptors: *Nondestructive testing, *Construction, *Construction materials, Test methods, Joints, Defects(Materials), Joining.

The report reviews nondestructive testing methods applicable to the construction industry. Established methods and methods still in development are included. Recently developed methods were evaluated from initial reports and prototype applications. A number of the new methods show promise in reducing inspection time or presenting information previously unobtainable. Existing and developing methods are also classified according to the construction materials and operations they test. The report is designed to help not only those interested in the field of nondestructive testing, but also those concerned with specific applications. (Author)

AD-774 848/6GA PC$4.50/MF$1.45
Army Engineer Waterways Experiment Station Vicksburg Miss
DYNAMIC STRENGTH STUDY OF SMALL FIXED-EDGE, LONGITUDINALLY RESTRAINED TWO-WAY REINFORCED CONCRETE SLABS.
Final rept. Apr 71-Jun 72,
Wayne M. Brown, and Michael S. Black. Dec 73, 101p Rept no. AEWES-TR-N-73-9
Contract DAHC20-68-W-0192

Descriptors: *Floors, *Reinforced concrete, *Structural response, *Fallout shelters, Strength(Mechanics), Dynamic response, Loading(Handling), Construction, Airburst, Static loads, Static tests, Civil Defense.
Identifiers: *Concrete slabs.

The study is one phase of an effort to develop criteria that will be helpful in evaluating or predicting the airblast load-carrying capacity of conventional floor slabs in existing Defense Civil Preparedness Agency approved shelters. The general objective of this study was to investigate the static and dynamic behavior of small, fixed-edge, longitudinally restrained, two-way reinforced concrete slabs. Twelve tests, four static and eight dynamic, were conducted on slabs with a clear span of 29 inches and a thickness of 0.89 inch. Two series of slabs corresponding to two different percentages of steel reinforcement (0.78 and 1.17 percent) were used. The slabs were subjected to uniformly distributed static loads up to 36.5 psi using water pressure and to dynamic airblast overpressures ranging from 26.5 to 56.8 psi using explosives. Measurements of pressure, deflection, and reinforcement strains were made, and results are presented. (Modified author abstract)

AD-775 467/4GA PC$20.50/MF$1.45
Air Force Weapons Lab Kirtland AFB N Mex
PROCEEDINGS OF ERIC H. WANG SYMPOSIUM ON PROTECTIVE STRUCTURES TECHNOLOGY, HELD AT KIRTLAND AIR FORCE BASE, NEW MEXICO, ON 21-23 JULY 1970. VOLUME I,
Howard E. Selheimer. Mar 71, 348p Rept no. AFWL-TR-71-193-Vol-I
See also report dated Mar 71, AD-775 468.

Descriptors: *Nuclear explosions, *Shelters, *Symposia, Nuclear explosion damage, Underground structures, Structural response, Airburst, Overpressure, Ground motion, Soil mechanics, Rock mechanics, Cratering, Ejecta.

The Eric H. Wang Symposium on Protective Structures Technology sponsored by the Air Force Weapons Laboratory was held at Kirtland Air Force Base, New Mexico, from 21 through 23 July 1970, to commemorate Eric H. Wang, a pioneer in Air Force protective construction, on the tenth anniversary of his death. The report is divided into six sections; one for each session of the symposium. Each address or paper is as the speaker presented in his manuscript. Beacuse of its length, the proceedings are contained in two volumes: sessions I through 4 in volume one, and sessions 5 and 6 in volume two. Broad topics discussed in volume one include the following: Airblast interactions; Material properties; and, Ground motions.

AD-775 468/2GA PC$15.75/MF$1.45
Air Force Weapons Lab Kirtland AFB N Mex
PROCEEDINGS OF ERIC H. WANG SYMPOSIUM ON PROTECTIVE STRUCTURES TECHONOLOGY, HELD AT KIRTLAND AIR FORCE BASE, NEW MEXICO, ON 21-23 JULY 1970. VOLUME II,
Howard E. Selheimer. Mar 71, 251p Rept no. AFWL-TR-71-193-Vol-2
See also report dated Mar 71, AD-775 467.

Descriptors: *Nuclear explosions, *Shelters, *Symposia, Nuclear explosion damage, Underground structures, Structural response, Airburst, Overpressure, Ground motion, Soil mechanics, Rock mechanics, Cratering, Ejecta.

On 21-23 July 1970, the Air Force Weapons Laboratory sponsored a symposium on protective structures technology to commemorate Eric H. Wang. This report contains the addresses and papers presented at the symposium. The papers reflect the state of the art in the areas of airblast interaction, material properties, ground motions, structure-media interaction and structural response, and cratering and simulation as they relate to nuclear explosions. Broad topics discussed in volume two include the following topics: Structural media interaction and structural response; and cratering and simulation.

AD-775 471/6GA PC$3.25/MF$1.45
Princeton Univ N J Dept of Civil and Geological Engineering
ON THE DYNAMIC RESPONSE OF A PRESTRESSED BEAM.
Research rept.,
Arnold D. Kerr. Sep 73, 22p Rept no. RR-73-SM-8 AROD-8798.1-E
Grants DA-ARO-31-124-71-G91, DA-ARO-31-124-73-G190
Sponsored in part by Grant DA-ARO-31-124-72-G45.

Descriptors: *Beams(Structural), Dynamic response, Bending moments, Cantilever beams, Resonant frequency, Helicopter rotors, Prestressing.

In the first part of the report the dynamic bending response of a prestressed beam, in which the prestressing rod is continuously supported, is studied analytically. It is found that an axial prestressing force which passes through the centroids of the beam cross sections, has no effect upon the bending response of the beam. In the second part of the paper a test set up of a prestressed cantilever beam is described and the determined natural frequencies are presented. The test results corroborate the analytical findings that the prestressing force has no effect upon the natural frequencies. (Author)

BDX-613-926(Rev.) PC$4.25/MF$1.45
Bendix Corp., Kansas City, Mo. (Usa).
VIBRATION ANALYSIS.
C. W. Jr. Berry. Dec 73, 42p
Contract AT(29-1)-613

Descriptors: (*Mechanical vibrations, *Measuring methods), Mechanical structures, Specifications.

For abstract, see NSA 29 05, number 12438.

COM-74-10323/5GA PC$4.75/MF$1.45
Hawaii Univ., Honolulu. Dept. of Mechanical Engineering.
HAWAII'S FLOATING CITY DEVELOPMENT PROGRAM. INTERNAL THERMAL AND HUMIDITY CONTROL.
Technical rept.,
Yoshihiko Yamashita. Nov 73, 135p* UNIHI-SEAGRANT-CR-74-01, TR-3 NOAA-74010406
Contract NOAA-2-35245

Descriptors: *Urban areas, *Floating bodies, *Offshore structures, Environmental engineering, Temperature control, Air conditioning, Humidity control, Ducts, Hawaii.
Identifiers: *Floating cities, Sea Grant program, Computer aided analysis.

The report is an investigation of some design aspects of a large floating platform to support urban activities in the Hawaiian Islands area. A brief account of weather and sea conditions in Hawaii is presented with an analysis of human comfor requirements. Various types of air conditioning systems are described and choices are made for specific locations within the Floating City. Equations are presented and sample calculations are performed for determining cooling load, by the response factor method, for a superstructure and a buoyancy tank case. Preliminary air duct design is performed for both cases. Absorption-cycle refrigeration is discussed, and a flow diagram and calculations are given. A computer program which performs the response factor calculations is presented. Finally, several conclusions drawn from this work are reported. (Author)

COM-74-10467/0GA PC$3.25/MF$1.45
Texas A and M Univ., College Station. Architecture Research Center.
PORT AND HARBOR DEVELOPMENT SYSTEM. PHASE 2 - PLANNING SUMMARY,
Russell L. Stogadill, and Mike Willingham. Oct 72, 43p TAMU-SG-72-209 NOAA-73100202

Descriptors: *Offshore structures, *Harbor facilities, Marine terminals, Harbors, Site surveys, Floating docks, Construction, Design criteria.
Identifiers: Sea Grant program.

The report is a planning summary relating to the port and harbor development system as considered by the Architecture Research Center, Texas A and M Univ. The solutions presented are not offered as panacea but rather to indicate a basic philosophy of planning representing an appropriate environmental character and general direction for growth with sufficient built-in flexibility to accommodate changing concepts as they occur. Concepts set forth concern offshore construction - mobile platforms, floating platforms, and artificial islands; site selection with consideration of meteorological factors; and various types of terminals to meet industrial needs.

COM-74-10481/1GA PC$3.75/MF$1.45
Texas Univ., Austin. Center for Building Research.
REGULATION AND EVALUATION OF INDUSTRIALIZED BUILDING: A LITERATURE REVIEW WITH ANNOTATED BIBLIOGRAPHY.
Final rept. 1940-1972,
J. Neils Thompson, and Clayford T. Grimm. Nov 73, 60p* NBS-GCR-73-19
Contract C-2-35948

Descriptors: *Buildings, *Construction management, *Bibliographies, Building codes, Standards, Land use zoning, Prefabrication, Modular structures, Evaluation.
Identifiers: *Industrialized housing, *Breakthrough operation.

The report covers literature published in the English language on the regulation and evaluation of industrialized building. The scope of the review includes the period from 1940 to April, 1972. A summary of the literature precedes the review. The summary follows the subject divisions used in the review. The review is divided into two parts, titled 'Regulation' and 'Evaluation'. The first part deals with methods used to regulate industrialized housing, including: building codes (local, state, and model); standards; and zoning. The second part deals with the methods used to evaluate industrialized housing, including administration of the evaluation process. (Modified author abstract)

COM-74-50184/2GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Center for Building Technology.
DESIGN, SITING, AND CONSTRUCTION OF LOW-COST HOUSING AND COMMUNITY BUILDINGS TO BETTER WITHSTAND EARTHQUAKES AND WINDSTORMS.
Final rept.,
William F. Reps, and Emil Simiu. Jan 74, 153p
NBS-BSS-48
Sponsored in part by Agency for International Development, Washington, D.C.
Paper copy available from GPO $4.85 as C13.29/2:48.

Descriptors: *Buildings, *Environmental engineering, *Storms, *Earthquakes, Turkey, Peru, Philippine Islands, Developing countries, Earthquake resistant structures, Avalanches, Site surveys, Structural engineering, Disasters.
Identifiers: *Low cost housing, *Windstorms.

The report provides technical information regarding characteristics of materials and building systems, and discusses the structural performance of buildings subjected to the action of earthquakes and wind forces with specific reference to structures typical of developing countries. Potential ways are described in which structures can be made more resistant to such action. Siting considerations are discussed from a geological, seismic and climatological viewpoint, and recommendations relating to siting problems are made. Techniques of housing construction, both traditional and industrialized, are described and improvements resulting in better earthquake or windstorm resistance are suggested. Building codes, their improvement and their enforcement are also discussed.

PATENT-3 168 814 Not available NTIS
Department of the Interior, Washington, D.C.
AUTOMATIC WATER CONTROL GATE.
Patent,
George R. Hurlburt. Filed 14 Sep 61, patented 9 Feb 65, 5p PAT-APPL-138 027, DOCKET/BIA-607
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Hydraulic gates, *Automatic control equipment, *Patents, Flow control, Irrigation, Water flow.
Identifiers: PAT-CL-61-25.

The invention relates to control of water elevation in bodies of water such as reservoirs and irrigation channels. An object of the invention is to provide an automatic flow control gate which utilizes the pressure of the upstream water supply to cause a lifting force on the gate to allow excess water to escape, and to maintain a substantially uniform upstream water elevation in the event of widely fluctuating flow in the upstream channel.

PB-227 841/4GA PC$12.00/MF$1.45
Bucknell Univ., Lewisburg, Pa. Dept. of Civil Engineering.
ANALYSIS AND FULL-SCALE LATERAL LOAD TESTS. PILE GROUP FOUNDATIONS.
Final rept.,

Jai B. Kim, Robert J. Brungraber, Carl H. Kindig, John L. Goodman, and L. P. Singh. Sep 73, 180p
Rept. no. R 68-25
Prepared by Pennsylvania Dept. of Transportation, Harrisburg, and Federal Highway Administration, Washington, D.C.

Descriptors: *Pile structures, *Pile foundations, Loads(Forces), Lateral pressure, Steel piles, Deflection, Dimensional analysis.

Lateral load tests were performed on three groups of six piles each and two isolated single piles (one vertical and one batter). Two groups had vertical piles, one group with 4 ft. spacing and one group with 3 ft. spacing. The third group also had 3 ft. spacing but four of the piles were battered to a slope of 3.5 to 1. The loading sequence was intended to simulate that of bridge abutment foundations. The results indicate that each pile in a group having 4 ft. spacing has a lateral load resistance approximately 4.3 times that of a single vertical pile while for a group having 3 ft. spacing the increase in lateral capacity is only by a factor of 2.2. The results also indicate that batter piles and groups containing batter piles undergo large amounts of lateral deflection even when subjected to vertical loads only. (Modified author abstract)

PB-228 458/6GA PC$4.25/MF$1.45
Sydney Univ. (Australia). Civil Engineering Labs.
SETTLEMENT OF PILE GROUPS BEARING ON STIFFER STRATA.
Research rept.,
H. G. Poulos, and N. S. Mattes. May 73, 21p R-215

Descriptors: *Pile structures, Settlement(Structural), Soil dynamics, Bearing piles, Bearing properties, Bearing strength, Australia.

Solutions are described for the settlement interaction between two piles which rest on a bearing stratum stiffer than the overlying soil. These solutions may be used to predict group settlement ratios for any general pile group. The stiffer bearing stratum decreases the settlement interaction, and hence the settlement ratio of a pile group. The effect is most pronounced for shorter stiffer piles; for slender piles, the nature of the bearing stratum is relatively unimportant unless the piles are almost rigid. (Author)

PB-228 618/5GA PC$4.00/MF$1.45
Commonwealth Scientific and Industrial Research Organization, Melbourne(Australia). Div. of Building Research.
ROOF DRAINAGE,
K. G. Martin. 1973, 19p Technical paper-1-2nd ser
International Standard Book no. 0 643 00091 7.

Descriptors: *Roofs, *Gravity drainage, Roofing, Drains, Rainfall intensity, Runoff, Design standards, Australia.

Factors relevant to the sizing of roof drainage channels under Australian rainstorm conditions are discussed and a method for direct design outlined. Equations developed empirically overseas are incorporated and specific drainage systems for low-and high-rise multi-story buildings are considered. (Author)

PB-228 680/5GA PC$6.50/MF$1.45
Texas Transportation Inst., College Station.
FIELD MEASUREMENTS OF LATERAL EARTH PRESSURES ON A PRE-CAST PANEL RETAINING WALL.
Research rept. Sep 70-Sep 73,
David M. Prescott, Harry M. Coyle, Lionel J. Milberger, and Richard E. Bartoskewitz. Sep 73, 68p TTI-2-5-70-169-3
See also AD-220 304.

Descriptors: *Retaining walls, *Backfills, Lateral pressure, Soil mechanics, Pressure measurement, Load cells, Transducers.

Pneumatic earth pressure cells are used to measure lateral earth pressures acting on a pre-cast panel retaining wall. Force transducers are used between the panel and the supporting structural members to measure the total force exerted on the panel by the backfill material. Accurate measurements of panel movements are made during and after backfilling. Data are presented for measured pressures, forces, and movements covering a period of 65 days. Physical and engineering properties of the backfill material are determined. Reasonably good correlation between the forces calculated from the pressure cell measurements and those measured by the force transducers tend to verify the adequacy of the pneumatic pressure cell calibration procedures.

TT-71-54025/7-8 PC$5.50
Department of Housing and Urban Development, Washington, D.C. Office of International Affairs.
BUILDING REVIEW. VOLUME 43, NUMBERS 7-8, 1971.
1973, 199p
Trans. of Przeglad Budowlany (Poland) v43 n7/8 p337-410 1971, by Waldemar Bartoszewski. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Construction industry, *Environmental aspects, Investment outlook, *Poland, Environmental engineering, Water economy, Dams, Urban areas, Sewage treatment, Facilities, Mining engineering, Waste utilization, Forestry, Reviews.

The range of subjects comprises problems connected with the role of the building investments in the domain of environment protection.

TT-72-52000 PC$6.50/MF$1.45
Bureau of Reclamation, Washington, D.C.
DRAFT TUBES OF HYDRO-ELECTRIC STATIONS,
M. F. Gubin. 1973, 254p
Trans. of mono. Otsasyvayushchie Truby Gidroelektrostantsii, Moscow, 1970, by Fagan Mohan. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Draft tubes, *Hydroelectric power generation, Design, Data, USSR, Translations.

The book reviews recent developments in the design and construction of draft tubes in the Soviet Union and Western Countries. Data regarding design construction and operation are presented, including the effect of these variables on capital investment and operating cost of hydroelectric power stations. Criteria for the selection of draft tubes based on design construction and operating conditions of hydro-electric projects are presented.

14. METHODS AND EQUIPMENT

14B. Laboratories, Test Facilities, and Test Equipment

AD-774 783/5GA Reprint
Harvard Univ Cambridge Mass Psycho-Acoustic Lab
STATIC FOR RADIO RECEIVER TESTS,
J. C. R. Licklider, and E. B. Newman. 1947, 6p
Rept no. PNR-29
Contract N5ori-7602
Availability: Pub. in Electronics, 4p Jun 47.

Descriptors: *Noise generators, Atmospherics, Noise(Electrical and electromagnetic), Test equipment, Radio receivers, Test methods.

The paper describes methods of imitating atmospheric static in the laboratory. It presents a simple quantitative method of specifying the characteristics of static which are important for receiver design, and it describes apparatus which simulates the various types of static.

AD-774 873/4GA PC$16.75/MF$1.45
Naval Postgraduate School Monterey Calif
DESIGN REPORT OF HYBRID COMPRESSOR AND ASSOCIATED TEST RIG.
Final rept.,
Michael H. Vavra. Jul 73, 274p Rept no. NPS-57VA73071A

Descriptors: *Centrifugal compressors, *Test equipment, *Gas turbines, Compressor rotors, Diffusers, Transonic characteristics, Torque, Turbojet engines.

The report presents the aerodynamic calculations and describes the mechanical features of a test rig that has been designed at the Turbopropulsion Laboratory, Department of Aeronautics, for research work on a special type of centrifugal compressor. This so-called Hybrid compressor consists of a centrifugal rotor with 180 deg flow deflection in the meridional plane followed by an axial flow diffusor. The report establishes a method to predict the off-design performance of the compressor, which can be applied also to conventional centrifugal compressors. Extensive use is made of modern programmable calculators, and programs are presented to show the effectiveness of these tools in engineering endeavors. (Author)

AD-775 054/0GA PC$5.00/MF$1.45
Toronto Univ (Ontario) Inst for Aerospace Studies
AN ANALYTICAL AND EXPERIMENTAL STUDY OF AN IMPLOSION-DRIVEN SHOCK TUBE,
S. K. Chan. Aug 73, 163p Rept no. UTIAS-191 AFOSR-TR-74-0190
Grant AF-AFOSR-2274-72

Descriptors: *Shock tubes, Hypervelocity, Drives, Implosions, Shock waves, Experimental design, Canada.

The UTIAS Implosion Driver uses the wave dynamics of a hemispherical implosion to raise the pressure and temperature of its driver gas to extreme values. Strong planar shock waves are thereby generated which alleviate the current shock-velocity plateau of conventional shock tubes. An analytical and experimental study was made of the performance of a 1-in dia shock tube driven by an 8-in dia hemispherical implosion driver. The analytical performance of the shock tube was predicted by numerically solving the set of governing nonlinear partial differential equations including appropriate loss mechanisms in the different regimes of the flow. A simplified solution was developed in the form of a simple equation allowing the maximum expected shock velocity to be predicted for a given set of initial conditions. (Modified author abstract)

AD-775 064/9GA Reprint
California Univ San Diego La Jolla Inst for Pure and Applied Physical Sciences
LASER DOPPLER VELOCIMETRY: EXPERIMENTAL STUDY,
C. P. Wang, and D. Snyder. 12 Mar 73, 6p
Contract DAHC04-72-C-0037
Availability: Pub. in Applied Optics, v13 n1 p98-103 Jan 74.

Descriptors: *Laser velocimeters, Heterodyning, Signal to noise ratio, Spectrum analyzers.
Identifiers: Comparison, Performance evaluation, Design.

An experimental study on the general characteristics of the three different optical arrangements, namely, local-oscillator heterodyne, differential heterodyne, and symmetric heterodyne,

is given. Both rotating Mylar disk and steady-state rotating flow are used to generate a uniform particle velocity or flow velocity. The power spectrum of the photoelectric current is obtained both in real time by a spectrum analyzer and numerically by a digital computer. An fm-demodulator is also used to obtain the instantaneous velocity. The S/N, stability, optimum particle concentration, and optimum receiving optics of these three optical arrangements are obtained. Their relative merit and their comparisons with theoretical results are also discussed. (Author)

AD-775 285/0GA PC$3.25/MF$1.45
Naval Ship Research and Development Center Bethesda Md
TECHNIQUE FOR MEASURING THE DYNAMIC YOUNG'S MODULUS AND LOSS FACTOR.
Final rept.,
Gerald R. Castellucci. Jan 74, 32p Rept no. NSRDC-4149

Descriptors: *Modulus of elasticity, *Measurement, Elastic properties, Acoustic properties, Dynamics, Plastics, Metals.

As a part of an extensive program for measuring acoustical properties of polymeric materials, equipment has been designed and set up to measure the dynamic Young's modulus of stiff materials with low acoustic dissipation. Both the elastic modulus and the loss factor are obtained. The method described is based on the excitation of longitudinal resonances in a suspended uniform thin rod having free-free end conditions. For samples of actual material, the results must be corrected for the effect of the radial inertia of the bar and the effects of the measurement equipment on the results. The properties of very lossy or limp materials are measured more conveniently by other techniques. (Author)

AD-775 547/3GA PC$3.25/MF$1.45
Maryland Univ College Park Dept of Physics and Astronomy
MEASUREMENT OF X-RAY CROSS SECTIONS RELEVANT TO A SCANNING ION MICROSCOPE.
Annual rept. no. 1, 1 Jul 72-30 Jun 73,
Robert K. Cacak, Song Sik Choe, and Frederick W. Martin. 26 Oct 73, 41p Rept no. TR-74-035
Contract N00014-67-A-0239-0026

Descriptors: *Microscopes, *Field emission, *X ray diffraction, Monitoring, X ray apparatus, Particle collisions, Spectrometers.
Identifiers: Design, Ion microscopes, *Scanning ion microscopy.

The purpose of the study is to determine the feasibility of using X rays generated by heavy ion-atom collisions as the monitoring signal in an ion microscope. Experimental progress in the design, construction, and operation of an experimental apparatus to measure the rate of X-ray production by heavy ions is described. Particular attention is paid to a new type of soft X-ray spectrometer. Preliminary X-ray cross sections obtained with the described apparatus are presented for 1.0 to 2.5 MeV ions incident upon a thin carbon target. The cross sections are found to increase with ion velocity in the range studied. (Modified author abstract)

ANCR-1130 PC$4.00/MF$1.45
Aerojet Nuclear CO., Idaho Falls, Idaho (Usa).
VARIABLE RELUCTANCE DISPLACEMENT TRANSDUCER TEMPERATURE COMPENSATED TO 650 EXP 0 F.
T. C. Piper, and J. B. Colson. Nov 73, 16p
Contract AT(10-1)-1375

Descriptors: (*Displacement gages, *Optimization), Design, High temperature, Hysteresis, Loft reactor.

For abstract, see NSA 29 05, number 10288.

BARC-704 PC$3.00/MF$1.45
Bhabha Atomic Research Centre, Bombay (India).
TOLERANCES IN LABORATORY GLASS-BLOWING.
G. K. Bhide. 1973, 10p
U.S. Sales Only.

Descriptors: (*Glass, *Shape), Configuration, Temperature control.

For abstract, see NSA 29 05, number 12437.

CEA-CONF-2188 PC$4.50/MF$1.45
ACOUSTIC EMISSION.
N. Chretien, and D. Miannay. Dec 72, 47p CONF-730218-2
In French. U.S. Sales Only.

Descriptors: (*Acoustic emission testing, *Reviews), Deformation, Phase transformations, Ruptures, Stresses, Welds.

For abstract, see NSA 29 05, number 10086.

COM-74-50069/5GA Not available NTIS
National Bureau of Standards, Washington, D.C.
ARC PLASMAS AS RADIATION STANDARDS IN THE VACUUM ULTRAVIOLET.
Final rept.,
W. L. Wiese. 1972, 29p
Pub. in Proceedings of Yugoslav Symposium and Summer School on the Physics of Ionized Gases (6th), 16-21 Jul 72, 29p.

Descriptors: *Far ultraviolet radiation, *Frequency standards, Electric arcs, Hydrogen, Plasmas(Physics).
Identifiers: Hydrogen plasma.

The principle of using arc plasmas as radiation standards in the vacuum ultraviolet is described, and it is shown that a hydrogen arc plasma has particularly suitable properties due to the fact that its atomic radiation constants are exactly known. The calibration work with a hydrogen arc plasma at NBS is discussed, and preliminary results with this recently established facility are presented.

COM-74-50115/6GA Not available NTIS
National Bureau of Standards, Washington, D.C.
THERMAL CONTACTS IN A LOW TEMPERATURE CRYOSTAT.
Final rept.,
Jack H. Colwell. 1973, 2p
Pub. in Cryogenics, v13 n11 p674-675 Nov 73.

Descriptors: *Cryostats, Electric relays.

The thermal conductances of an assembly used for thermally anchoring electrical leads in a low temperature cryostat are reported. Measurements were made between 0.3 and 4K of the conductance across the contacts of miniature gold-plated electrical connectors, insulated copper wires varnished to a copper mounting, and the copper mounting bolted to a copper support.

COM-74-50176/8GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Boulder, Colo. Cryogenics Div.
STANDARD REFERENCE MATERIALS: ELECTRICAL RESISTIVITY OF ELECTROLYTIC IRON, SRM 797, AND AUSTENITIC STAINLESS STEEL, SRM 798, FROM 5 TO 280 K.
Special publication,
J. G. Hust. Feb 74, 21p NBS-SP-260-47
Library of Congress Catalog no. 74-600002. Sponsored in part by National Aeronautics and Space Administration, Cleveland, Ohio.
Paper copy available from GPO $0.55 as C13.10:260-47.

Descriptors: *Electrical resistance, *Standards, Iron, Austenitic stainless steels.
Identifiers: *Standard reference materials.

Electrical resistivity data are presented for characterized electrolytic iron, SRM 797, and austenitic stainless steel, SRM 798, at temperatures from 5 to 280 K. Resistivities at ice and liquid helium temperatures were determined for 22 randomly selected iron specimens and the same number of steel specimens. These data indicate that the effect of material variability is about 1% for each of these SRM's. (Author)

COM-74-50182/6GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C.
SOME REFERENCES ON METRIC INFORMATION WITH CHARTS ON ALL YOU NEED TO KNOW ABOUT METRIC; METRIC CONVERSION FRACTORS.
Special pub.,
W. Small. Dec 73, 13p NBS-SP-389
Paper copy available from GPO $0.25 as C13.10:389.

Descriptors: *Metric system, Conversion, Tables(Data).

As metric use increases in this country, interest in metric information is also increasing. This booklet was developed to provide a listing of sources for pertinent metric information. Included is a list of publications produced by the National Bureau of Standards and available from the Superintendent of Documents. Also included is a list assembled by the National Council of Teachers of Mathematics of organizations that market metric materials for educators, and a list of additional sources of metric information.

COO-1469-234 PC$4.00/MF$1.45
Illinois Univ., Urbana (Usa). Dept. Of Computer Science.
DESIGN OF A HIGH NOISE IMMUNITY ANALOG FREQUENCY COUNTER.
M. C. Loessel. Oct 73, 40p UIUCDCS-R-73-595
Contract AT(11-1)-1469

Descriptors: (*Analog systems, *Counting circuits), (*Analog-to-digital converters, *Pulses), Digital systems, Pulse circuits.

For abstract, see NSA 29 05, number 12415.

KFK-1871 PC$3.00/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Neutronenphysik und Reaktortechnik.
CONSTRUCTION AND TESTING OF TWO PIERCE-TYPE ELECTRON GUNS.
H. U. Karow. Sep 73, 14p
In German. U.S. Sales Only.

Descriptors: (*Pierce electron guns, *Design), Performance testing.

For abstract, see NSA 29 05, number 11158.

N74-15109/3GA PC$3.00/MF$1.45
National Physical Lab., Teddington (England). Div. of Quantum Metrology.
THE GYROMAGNETIC RATIO OF THE PROTON.
Progress Report.
P. Vigoureux, and N. Dupuy. Aug 73, 15p NPL-QU-26

Descriptors: *Electric current, *Electrical resistance, *Gyromagnetism, *Protons, Coefficients, Flux density, Magnetic fields, Phase locked systems, Proton precession, Resistors, Variations.

For abstract, see STAR 1206

N74-15286/9GA PC$3.75/MF$1.45
Defence Research Information Centre, Orpington (England).

THE INTERFERENCE-FREE MEASUREMENT OF THE WEIGHT PER UNIT AREA OF MESHED MATERIAL.
G. Buehler. Jul 73, 33p DRIC-TRANS-3197, BR30541
Tran-Transl. Into English from Melliand Textilber. Intern. (Heidelberg), V. 53, No. 11, 1972 p 1236-1244.

Descriptors: *Nondestructive tests, *Radiometers, *Units of measurement, *Weight (Mass), *Yarns, Krypton 85, Mesh, Quality control, Shrinkage.

For abstract, see STAR 1206

PATENT-3 054 295 Not available NTIS
Department of the Interior, Washington, D.C.
METHOD AND APPARATUS FOR DETERMINING RATE OF PRESSURE CHANGE.
Patent,
Eugene L. Burner. Filed 26 Jun 58, patented 18 Sep 62, 3p PAT-APPL-744 881, DOCKET/MIN-334
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Pressure gages, *Patents, Rates(Per time), Pressure.
Identifiers: PAT-CL-73-391.

The patent relates to a method and apparatus for determining minute changes of pressure and for determining the rate of change of a varying pressure.

PATENT-3 069 907 Not available NTIS
Department of the Interior, Washington, D.C.
MAGNETIC TYPE CURRENT METER.
Patent,
James E. Eddy. Filed 22 Jul 60, patented 25 Dec 62, 6p PAT-APPL-44 822, DOCKET/SUR-452
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Flowmeters, Fluid flow, Magnets, Electric switches.
Identifiers: PAT-CL-73-229.

The patent relates to improvements in current meters used in measuring the discharge or rate of flow of a stream fluid. A unique magnetically operated rotation sensing arrangement is provided thereby for translating the motion of the meter element driven by the flowing stream, into signals operative to control an indicator. The new and improved simplified construction of the invention results in a more accurate and dependable meter, requiring less maintenance, and having a longer useful life.

PATENT-3 387 487 Not available NTIS
Department of the Interior, Washington, D.C.
RECORDING GAS COLLECTOR.
Patent,
Arthur L. Hodges, Jr. Filed 18 Oct 65, patented 11 Jun 68, 3p PAT-APPL-497 562, DOCKET/SUR-703
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Accumulators, *Gases, Solutions, Ground water.
Identifiers: PAT-CL-73-19.

The present invention relates to methods and apparatus for measuring undissolved gas content in a liquid. In particular it si concerned with a continuous sampling technique in which liquid, such as ground water produced from wells, is pumped at a constant volumetric rate to a sealed collector vessel where insoluble gases, such as methane, are separated from the liquid phase and permitted to accumulate over a period of time until the gases fill the vessel, at which time the gases are vented from the collector vessel. The rate at which gas accumulates in the vessel is a measure of the gas content of the input stream sample. Liquid level in the vessel is recorded as a function of time and furnishes the basis for analysis of the liquid-gas composition.

PATENT-3 463 717 Not available NTIS
Department of the Interior, Washington, D.C.
REFERENCE AND GLASS ELECTRODES CAPABLE OF WITHSTANDING HIGH PRESSURES.
Patent,
Francis C. Koopman, and J. L. Kunkler. Filed 7 Jan 66, patented 26 Aug 69, 5p PAT-APPL-519 396, DOCKET/SUR-743, DOCKET/SUR-744
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Electrodes, High pressure tests.
Identifiers: *Glass electrodes, PAT-CL-204-195.

This invention relates to improvements in reference and glass electrodes. A reference electrode is provided with flexible, distensible electrolyte reservoir walls to maintain the pressure within the electrode electrolyte at a greater pressure than the surrounding working environment. A glass electrode is provided with flexible walls to equalize the pressure across the electrode's fragile glass membrane.

PATENT-3 553 501 Not available NTIS
Department of the Interior, Washington, D.C.
ULTRASONIC PIEZOELECTRIC TRANSDUCER CARTRIDGE.
Patent,
Richard E. Thill. Filed 16 Feb 68, patented 5 Jan 71, 5p PAT-APPL-706 080, DOCKET/MIN-1201
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Piezoelectric transducers, *Patents, Piezoelectric crystals, Cartridges.
Identifiers: PAT-CL-310-8-2.

The patent describes a transducer cartridge assembly providing means to readily interchange transducer crystals and to match crystal inpedance with that of the backing member.

PATENT-3 748 892 Not available NTIS
Department of the Air Force Washington D C
HIGH PRECISION DILATOMETER.
Patent,
Jesse R. McKendree, Jr., and John R. Koenig. Filed 18 Apr 72, patented 31 Jul 73, 8p Rept nos. PAT-APPL-245 151,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washinton, D.C. 20231 $0.50.

Descriptors: *Dilatometers, *Patents, Furnaces, Thermal expansion.
Identifiers: PAT-CL-73-16.

The patent consists briefly in a new and improved dilatometer device that incorporates, in part, a furnace, an evacuated tube extending through the furnace, and an elongated double-bar support for supporting the test specimen in horizontal relation thereon.

PATENT-3 750 013 Not available NTIS
Department of the Air Force Washington D C
MICROSTRIP PLASMA PROBE.
Patent,
Walter Rotman, and Nicholas V. Karas. Filed 21 Oct 70, patented 31 Jul 73, 5p Rept nos. PAT-APPL-82 657,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Probes(Electromagnetic), *Patents, Plasma sheaths, Blackout(Propagation), Strip transmission lines.
Identifiers: PAT-CL-324-58, Plasma diagnostics.

In the patent, a microstrip cavity type transmission line having a lossy center conductor provides attenuation and reflection coefficient information in response to the disturbing effects of proximate conducting surfaces or plasma. Equivalent conductance and susceptance of the plasma and the proximity of conducting surfaces can be determined by using such information to solve standard transmission line formulas.

PATENT-3 753 472 Not available NTIS
Department of the Air Force Washington D C
LIGHT PRESSURE OPERATED MICROBALANCE SYSTEM.
Patent,
Jens P. Dybwad, Winser E. Alexander, and Karl P. Zinnow. Filed 12 Aug 71, patented 21 Aug 73, 5p Rept nos. PAT-APPL-171 077,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, Display systems, Beams(Radiation), Light, Resolution, Balances, Accuracy, Sensitivity, Data processing.
Identifiers: *Microbalances, PAT-CL-177-210, Weight measurement.

This invention relates to microbalances and more particularly to an electronic read out system for undamped swinging balances. The invention enhances the resolution and accuracy of a balance and is achieved by automatically sensing the null level crossings of an undamped swinging balance and measuring the time intervals between the null crossings. The time intervals of successive half periods are then compared and processed to produce an off-balance signal in relation to the sample weight changes on the balance.

PATENT-3 777 552 Not available NTIS
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
ULTRASONIC SCANNING SYSTEM FOR IN-PLACE INSPECTION OF BRAZED TUBE JOINTS.
Patent.
J. L. Haynes, C. G. Wages, and H. S. Haralson.
Patented 11 Dec 73, 6p NASA-CASE-MFS-20767-1,
Misc-Filed 9 Nov. 1971 Supersedes N72-21482 (10 - 12, p 1618).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Stainless steels, *Ultrasonic tests, *Welded joints, Nondestructive tests, *Patents, Pipes (Tubes), Scanners.

A miniaturized ultrasonic scanning system for nondestructive in-place, non-immersion testing of brazed joints in stainless-steel tubing is described. The system is capable of scanning brazed tube joints, with limited clearance access, in 1/4 through 5/8 inch union, tee, elbow and cross configurations. The system has the capability to detect defective conditions now associated with material density changes in addition to those which are depended upon density variations. The system includes a miniaturized scanning head assembly that fits around a tube joint and rotates the transducer around and down the joint in a continuous spiral motion. The C-scan recorder is similar in principle to conventional models except that it was specially designed to track the continuous spiral scan of the tube joint. The scanner and recorder can be operated with most commercially available ultrasonic flaw detectors.

PATENT-3 780 563 Not available NTIS
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

INSITU TRANSFER STANDARD FOR UTL-RAHIGH VACUUM GAGE CALIBRATION.
Patent.
R. A. Outlaw, R. E. Stell, and R. F. Hoyt. Patented 25 Dec 73, 7p NASA-CASE-LAR-10862-1, Misc-Filed 14 Jul. 1972 Supersedes N72-28460 (10 - 19, p 2564).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Calibrating, *Ultrahigh vacuum, *Vacuum gages, Compacting, *Patents, Solid solutions.

A compact insitu calibration assembly, for ultrahigh vacuum gauges is described. The system depends on the repeatable generation of a specific gas pressure by the dissociation of a solid solution chemical compound when subjected to a given temperature. A precise temperature measurement is related to the pressure generated within the vacuum by the properties of the solid solution compound. this accurately establishes the gas pressure which in turn is used to calibrate a vacuum gauge. Also included is a metering orifice used in the calibration system and which is made movable to facilitate the degassing bakeout required in ultrahigh vacuum devices.

PATENT-3 782 177 Not available NTIS
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
METHOD AND APPARATUS FOR NON-DESTRUCTIVE TESTING.
Patent.
J. M. Hoop. Patented 1 Jan 74, 6p NASA-CASE-MFS-21233-1, Misc-Filed 20 Apr. 1972 Supersedes N72-25627 (10 - 16, p 2183).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Arc discharges, *Pulse generators, *Ultrasonic tests, High frequencies, *Patents.

High voltage is applied to an arc gap adjacent to a test specimen to develop a succession of high frequency arc discharges. Those high frequency arc discharges generate pulses of ultrasonic energy within the test specimen without requiring the arc discharges to contact that test specimen and without requiring a coupling medium. Those pulses can be used for detection of flaws and measurements of certain properties and stresses within the test specimen.

PATENT-3 782 699 Not available NTIS
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
BIMETALLIC FLUID DISPLACEMENT APPARATUS.
Patent.
T. N. Canning. Patented 1 Jan 74, 5p NASA-CASE-ARC-10441-1, Misc-Filed 11 Aug. 1972 Supersedes N73-30461 (11 - 21, p 2552).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Bimetals, *Displacement, *Equipment, *Gas heating, *Liquids, Deformation, *Patents, Stirring.

Stirring and heating stored gases and liquids is accomplished by using the deformation of a bimetallic structure which deforms significantly when heated. The deformation is used to effect gradual or impulsive motion of a piston, vane, wire, or diaphram for displacement of the fluid. The heated bimetallic is also employed for heating the stored fluid.

PB-228 094/9GA PC-GPO/MF$1.45-NTIS
Environmental Systems Corp., Knoxville, Tenn.
EXPLICIT CALIBRATION OF THE PILLS II SYSTEM,
Frederick M. Shofner. Sep 73, 35p W74-04198, EPA-660/2-73-011
Paper copy available GPO $0.65 as EP1.23:660/2-73-011.

Descriptors: *Aerosols, *Detectors, *Cooling towers, Calibrating, Windward drift, Design, Particles.
Identifiers: *Air pollution detection, PILLS detectors, Particulate instrumentation by laser light scattering.

This report is an extension of work to demonstrate the effectiveness of cooling tower drift instrumentation which Environmental Systems had developed up to that point in time. The prime instrumentation discussed was the Particulate Instrumentation by Laser Light Scattering (PILLS I) system. At the time, an explicit calibration of PILLS I using water droplets had not been performed. The report discusses primarily an explicit calibration of the PILLS II istrument which is an update of the PILLS I. It describes the PILLS II generation equipment, its calibrations and data interpretation procedures. The describing equations for PILLS are given, along with the defining equations relevant to the drift properties measured. These latter equations are of general utility and are independent of measurement techniques.

RFP-2090 PC$4.00/MF$1.45
Dow Chemical U.S.a., Golden, Colo. Rocky Flats Div.
ACOUSTIC EMISSION SOURCE LOCATION ON A NONSPHERICAL SURFACE OF REVOLUTION.
V. E. Sackschewsky, and L. A. Lott. 19 Nov 73, 47p
Contract AT(29-1)-1106

Descriptors: (*Acoustic emission testing, *Surfaces), Computer codes, Configuration, Spherical configuration, Transducers.

For abstract, see NSA 29 05, number 12478.

SLA-73-1001 PC$5.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
TECHNIQUE FOR INTERFEROMETER SIDE GAGING MEASUREMENT OF ELECTRON BEAM INDUCED STRESS GENERATION IN POROUS MATERIALS AND ITS APPLICATION TO POROUS CARBON.
D. A. Benson, and A. L. Ouellette. Nov 73, 59p
Contract AT(29-1)-789

Descriptors: (*Carbon, Electron beams), (*Organic polymers, Electron beams), (*Solids, Electron beams), (*Electron beams, *Stresses), Equations of state, Grueneisen constant, Interferometers, Measuring methods, Porosity.

For abstract, see NSA 29 05, number 12486.

TRITA-KKE-7302 PC$5.25/MF$1.45
Kungliga Tekniska Hoegskolan, Stockholm (Sweden). Institutionen Foer Kaernkemi.
REPORT TO THE NATIONAL ENVIRONMENTAL PROTECTION BOARD 1971--1972 (DEVELOPMENT OF ANALYTICAL METHODS FOR MERCURY, CADMIUM).
T. Westermark, and S. Forberg. Feb 73, 62p
In Swedish. U.S. Sales Only.

Descriptors: (*Environment, *Pollution), Leading abstract, Research programs.

For abstract, see NSA 29 05, number 10278.

UCID-16364 PC$3.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
NEW TRANSIENT SURFACE-CURRENT SENSOR AND RECORDER.
E. J. Hsieh, and K. E. Vindelov. 19 Oct 73, 14p
Contract W-7405-eng-48

Descriptors: (*Electric currents, Transients), (*Transients, *Measuring methods), (*Films, Electric currents), Coercive force, Electric conductors, Pulses, Surfaces.

For abstract, see NSA 29 05, number 12489.

Y-1926 PC$4.00/MF$1.45
Oak Ridge Y-12 Plant, Tenn. (Usa).
ACOUSTIC EMISSION ENERGY TO PULSE HEIGHT CONVERTER.
B. W. Speller. 18 Dec 73, 16p
Contract W-7405-eng-26

Descriptors: (*Pulse converters, *Acoustic emission testing), Amplitudes, Electronic circuits, Piezoelectricity.

For abstract, see NSA 29 05, number 12493.

14C. Recording Devices

N74-14895/8GA PC$6.75/MF$1.45
IIT Research Inst., Chicago, Ill.
FEASIBILITY MODEL OF A HIGH RELIABILITY FIVE-YEAR TAPE TRANSPORT, VOLUME 2.
Technical Report, 5 Jan. 1972 - 5 Nov. 1973.
R. L. Eshleman, A. P. Meyers, W. A. Davidson, R. C. Gortowski, and M. E. Anderson. Oct 73, 93p
NASA-CR-132898
Contracts NAS5-21692, IITRI PROJ. E6225

Descriptors: *Reliability engineering, *Spacecraft instruments, *Tape recorders, Electronic equipment, Mechanical drives, Performance tests, Service life, Specifications.

For abstract, see STAR 1206

14D. Reliability

AD-774 825/4GA PC$4.50/MF$1.45
Army Materiel Command Texarkana Tex Intern Training Center
UTILIZATION OF BURN-IN DATA IN DETERMINING CONSTANT FAILURE RATE,
William T. Craddock, and Joseph W. Foster. May 73, 123p Rept no. USAMC-ITC-1-73-05
Prepared in cooperation with Texas A and M Univ., Austin.

Descriptors: *Reliability, Life tests, Failure, Rates, Distribution functions, Statistical analysis, Estimates, Probability density functions, Computer programs.
Identifiers: Failure rate functions, Maximum likelihood estimation, Newton-Raphson method.

The research investigates a three-parameter model for a hazard function that adequately describes the infant mortality and useful life regions of the bathtub curve. The corresponding time-to-failure probability density function is derived and the maximum likelihood equations are developed for the three parameters. The resulting system of equations is transcendental. The Newton-Raphson Method, an iterative technique, is employed to solve this system of equations. Also, an algorithm for determining a starting solution set for the Newton-Raphson Method is discussed. Computer programs are provided for both the Newton-Raphson Method and the starting solution algorithm. (Modified author abstract)

AD-774 888/2GA PC$3.25/MF$1.45
George Washington Univ Washington D C Program in Logistics
A BAYESIAN ASSESSMENT OF COHERENT STRUCTURES,
David V. Mastran, and Nozer D. Singpurwalla. 14 Jan 74, 25p Rept no. Serial-T-293
Contract N00014-67-A-0214-0001

Descriptors: *Reliability, Mathematical prediction, Probability density functions, Theorems.
Identifiers: Bayesian analysis.

In this paper the authors develop procedures for estimating the reliability of a coherent structure when a prior distribution is assigned to the reliability of the structure function and when failure data on either the structure, its elements, or on both are available. For structures comprised of independent elements connected either in series or in parallel, the authors obtain all the moments of the posterior distribution of the reliability of the structure function, for any prior distribution assigned to it. Bounds are obtained on the moments of the posterior distribution of the reliability of the structure function when the elements of the structure are associated. (Modified author abstract)

14E. Reprography

AD-775 288/4GA PC$6.00/MF$1.45
Naval Underwater Systems Center New London Conn New London Lab
METHODS FOR ACOUSTIC HOLOGRAPHY AND ACOUSTIC MEASUREMENTS.
Technical rept.,
Wolfgang K. Fischer. 27 Dec 73, 250p* Rept no. NUSC-TR-4685

Descriptors: *Holography, Acoustic waves, Acoustic detectors, Image converters, Interferometry, Ultrasonic radiation.
Identifiers: *Acoustic holography, Interferometric holography.

A novel 'four step acoustical holographic imaging system' is described and several means to implement it are theoretically and experimentally analyzed. The 'holographic sound image converter,' consisting of an optical 'holographic interferometer' and an acoustic 'coupler' is introduced, analyzed, and compared to existing acoustic detectors and a number of its advantages are cited. The new technique of 'shifted reference holographic interferometry' is presented. Also, a detailed study is conducted concerning the development and testing of a mechanical velocity transformer consisting of two lossy, nearly quarter-wave plates. (Modified author abstract)

COM-74-10538/8GA PC$3.00/MF$1.45
National Technical Information Service, Springfield, Va.
KIRLIAN PHOTOGRAPHY: A BRIEF BIBLIOGRAPHY.
Rept. for Jun 64-Mar 74,
Jeanne Weber Ringe. Mar 74, 10p NTIS-SR-74-02

Descriptors: *Photography, Electric discharges, Color photography, Photographic equipment, Electric corona.
Identifiers: *Kirlian photography.

The NTISearch bibliography contains 5 selections of research reports on Kirlian photography retrieved using the NTIS on-line search system--NTISearch.

PAT-APPL-319 591 PC$4.00/MF$1.45
Department of the Air Force Washington D C
INNER SURFACE SINGLE BEAM REFLECTED LIGHT HOLOGRAM.
Patent Application,
James A. McKinnes. Filed 29 Dec 72, 12p Rept no.

Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Holograms, Photographic plates, Patents.
Identifiers: PAT-CL-356-109, *Patent applications.

An object of this invention is to provide an apparatus for, and two methods of, making a hologram plate, and of viewing and studying a hologram. This is to be done without the need for a very careful set-up and alignment of, and without requiring a relatively large quantity and variety of, component parts (optical and otherwise) of the conventional holographic apparatus and/or of the component parts thereof used in the performance of the steps of the typical method which is presently used to make and to view a hologram.

PATENT-3 782 825 Not available NTIS
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
METHOD AND APPARATUS FOR CHECKING THE STABILITY OF A SETUP FOR MAKING REFLECTION TYPE HOLOGRAMS.
Patent.
H. G. Lackner. Patented 1 Jan 74, 5p NASA-CASE-MFS-21455-1,
Misc-Filed 18 Aug. 1972 Supersedes N72-31515 (10 - 22, p 2974).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Holography, *Stability tests, *Patents, Recording instruments, Vibration.

A method and apparatus are described for checking the stability of a setup for recording reflection-type (white light) holograms. Two sets of interference fringes are simultaneously obtained, one giving information about coherence and stability of the setup alone and the other demonstrating coherence of the entire system, including the holographic recording plate. Special emphasis is given to the stability of the plate, due to the fact that any minute vibration might severely degrade or completely destroy the recording.

SLA-73-923 PC$4.50/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
OPTICAL CONTRAST ENHANCEMENT OF MOVING TARGETS.
F. K. Bechtel, and J. W. Langenhorst. Nov 73, 48p
Contract AT(29-1)-789

Descriptors: (*Aircraft, *Photography), Missiles, Optical systems, Rockets, Vidicons.

For abstract, see NSA 29 05, number 12484.

15. MILITARY SCIENCES

15C. Defense

AD-774 812/2GA PC$21.50/MF$1.45
Braddock Dunn and Mcdonald Inc Albuquerque N Mex
TACOS 11.7 RADAR TRAINABILITY AND SEPARATE MISSILE LAUNCHER SUBMODELS.
Final rept.,
J. N. Gant, S. H. Garrison, and J. J. Sikora. 31 Dec 73, 370p Rept no. BDM/A-10-74-TR
Contract DAEA18-72-A-0192

Descriptors: *Antiaircraft defense systems, *Fire control radar, *Guided missile launchers, *Computer programming, Guided missile models, Radar trainers, Phased arrays, Antiaircraft fire control systems, Decision making, Computerized simulation.
Identifiers: TACOS 2 computer program, Radar trainability.

The report describes the trainability and separate missile launcher submodels developed and implemented in the TACOS 2 model.

AD-775 376/7GA PC$5.50/MF$1.45
Army Mobility Equipment Research and Development Center Fort Belvoir Va
GENERAL-PURPOSE BARBED TAPE OBSTACLE,
Arthur Thomas Stanley. Nov 73, 47p Rept no. USAMERDC-2077

Descriptors: *Perimeters(Defense), *Antipersonnel weapons, *Barriers, Passive defense, Wire, Tapes, Coils, Containers, Cost effectiveness.

The report contains a summary description of all activity pursued in development of the general-purpose barbed tape obstacle (GPBTO). The report concludes that: The GPBTO is significantly more effective than the Triple Standard Concertina (TSC) fabricated from either barbed wire or (German) Barbed Tape Concertina. The GPBTO can be emplaced by dismounted personnel with one-twentieth the effort required for TSC. When emplaced by vehicle, it can be erected with about two one-hundredths the effort required for TSC. The material cost for the GPBTO is about twice that of TSC. This increase cost is compensated for by the increased effectiveness (factor of three minimum) so that the GPBTO is one and one-half times as cost effective as the TSC. (Modified author abstract)

AD-775 479/9GA PC$4.25/MF$1.45
Army War Coll Carlisle Barracks Pa
AN ANALYSIS OF THE SELECTED RESERVE FORCES SYSTEM.
Student essay,
Perry B. Woolridge. 20 Oct 70, 23p

Descriptors: *Military reserves, Military training, Combat readiness.
Identifiers: *National Guard.

The essay discusses the Selected Reserve Force which was formed from Army National Guard and Army Reserve units from across the nation 27 September 1965 and was discontinued 30 September 1969. Most units successfully completed an accelerated training program and achieved a high level of combat readiness in record time but did not maintain the high level of readiness for an extended period of time. The essay recommends a system of training similar to that employed by the Selected Reserve Force to enable Army National Guard units to achieve and maintain an enduring high level of readiness. (Author)

AD-775 480/7GA PC$4.75/MF$1.45
Army War Coll Carlisle Barracks Pa
AN ALL-VOLUNTEER ARMED FORCE: A VITAL COMPONENT, NOT AN ALTERNATIVE.
Student essay,
Carter E. Porter. 1 Oct 70, 31p

Descriptors: *Military forces(United States), Military reserves, Military training.
Identifiers: All volunteer armed forces.

The study examines military training to meet the varying levels of mobilization requirements. The author contends that the optimum balance between cost, strength, and public support can best be achieved with a combination of: (1) a highly-paid volunteer force of career 'regulars', (2) a backup, active defense force of short-term volunteers or draftees, (3) a strong reserve, (4) a short Universal Military Training and Classification program, and (5) an optional Universal National Service Program.

AD-775 481/5GA PC$4.25/MF$1.45
Army War Coll Carlisle Barracks Pa
AN ALL-VOLUNTEER ARMY: PROBLEM OR OPPORTUNITY.
Student essay,
Elmer L. Stephens. 1 Dec 70, 22p

Descriptors: *Military forces(United States), Reviews.
Identifiers: All volunteer armed forces.

The purpose of the paper is to evaluate the concept of an all-volunteer Army. The evaluation is made in view of current national security requirements, the apparent restructuring of national pri-

orities now in progress, and the inherent concept of civilian control over the military. (Author)

AD-775 497/1GA PC$4.25/MF$1.45
Army War Coll Carlisle Barracks Pa
THE ONE ARMY RESERVE CONCEPT.
Student essay,
Walter K. Tagawa. 16 Oct 70, 21p

Descriptors: *Military reserves, Reviews.

The Reserve components constitute almost one-third of the forces required to support the contingency war plans. The Army's Reserves are currently organized and administered under a two-component system which is complicted, duplicative and costly. In considering the pending all-volunteer army, the purpose of the thesis is to determine the feasibility of reorganizing this system into a one Army Reserve Component. (Author)

ORNL-4860 PC$7.60/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
EXPEDIENT SHELTERS SURVEY. FINAL REPORT.
G. A. Cristy. Jul 73, 186p

Descriptors: (*Civil defense, Shelters), (*Shelters, *Radiation protection), Bibliographies, Design, Human populations, Local fallout, Nuclear explosions, Nuclear weapons, Safety, Usa.

For abstract, see NSA 29 05, number 12353.

15E. Logistics

AD-774 807/2GA PC$3.25/MF$1.45
Army Mobility Equipment Research and Development Center Fort Belvoir Va
TRAILER MOUNTING OF THE FORWARD AREA REFUELING EQUIPMENT TWO-POINT DISPENSING EQUIPMENT.
Final rept. 22 Aug 72-3 Jan 73,
James E. Christopher. Nov 73, 35p Rept no. USAMERDC-2079

Descriptors: *Helicopters, *Refueling, *Fuel systems, Fuel hose, Fuel pumps, Trailers, Dispensers, Forward areas, Experimental design.

The report covers the design and development of a trailer-mounted two-point, fuel-dispensing system designed primarily for refueling helicopters. The task was undertaken in response to a request from Modern Army Selected Systems Test Evaluation and Review (Project MASSTER) Fort Hood, Texas. The requirement was for preassembled, trailer-mounted, air transportable refueling equipment to be evaluated for inclusion in a new concept of logistical support operations, performed behind the battle lines, to improve the combat effectiveness of attack helicopters. The concept is directed toward operating a highly mobile Forward Area Refueling/Rearming Point.

AD-774 826/2GA PC$4.75/MF$1.45
Army Logistics Management Center Fort Lee Va
INSTITUTE OF LOGISTICS RESEARCH ANNUAL REPORT FOR FISCAL YEAR 1973,
David A. Ameen, J. T. Tambe, Roy L. Schooling, and Bernard B. Rosenman. Jul 73, 149p

Descriptors: *Army operations, *Logistics, *Research management, Army equipment, Army procurement, Inventory analysis, Management planning and control, Cost analysis.

The report summarizes the accomplishments during FY 1973 of the Institute of Logistics Research, U.S. Army Logistics Management Center. A far-reaching program of logistics research is described, as performed by the three constituent offices – the Logistics Studies Office, the Procurement Research Office, and the Inventory Research Office. The history of the Institute, FY 73 publications, descriptions of all completed and ongoing studies, and highlights of the year are presented. (Author)

AD-774 834/6GA PC$4.00/MF$1.45
Army Engineer Waterways Experiment Station Vicksburg Miss
INVESTIGATION OF DUST-CONTROL MATERIALS.
Final rept.,
Clarence R. Styron, III, and Royce C. Eaves. Dec 73, 71p Rept no. AEWES-Misc-Paper-S-73-70

Descriptors: *Dust control, *Military operations, *Southeast Asia, Test methods, Cements, Coal tar, Asphalt, Plastics.
Identifiers: Polyvinyl acetate.

The report describes a program instituted in an attempt to control dust during military operations in the Southeast Asia theater of operations. Dust was reported to be seriously reducing the life expectancy of machinery, increasing the time required for refueling and other services, increasing logistics problems, seriously lowering the morale of troops, and in some instances providing the enemy with dust signatures of the locations of operations. A screening procedure was set up whereby a series of tests could readily determine the potential of a material on the basis of its comparison with all others tested. Successful products were processed through a laboratory investigation, a traffic test, a downwash blast test, a weathering cycle test, and finally a field test. Seven companies under dust-control research contracts submitted approximately 29 percent of the materials tested. Approximately 56 percent of the materials field tested were contract developed, and one of these, SS-1295, a polyvinyl acetate product, was selected as having the greatest potential for satisfying the military requirements. (Modified author abstract)

AD-775 053/2GA PC$4.00/MF$1.45
Air Force Academy Colo
PROJECT 'P. O. L.' (PETROLEUM, OIL, AND LUBRICANTS): OPTIMIZING PROCUREMENT OF AVIATION FUELS FOR DEFENSE SUPPLY AGENCY.
Final rept.,
Larry M. Austin, and William W. Hogan. Jan 74, 93p Rept no. USAFA-TR-74-2

Descriptors: *Military procurement, *Aviation fuels, Optimization, Linear programming, Contracts, Bargaining, Computer programs, FORTRAN, Network flows, Costs.
Identifiers: Polka computer program, Out of kilter algorithm.

Defense Department requirements for aviation fuels are met with purchases made in the usual competitive bidding environment. This large-scale contract bidding and selection problem is modeled as a mixed integer linear program with a special structure. The solution of this large optimization problem is approached via an algorithm employing decomposition and implicit enumeration techniques which exploit the special structure of the underlying formulation. Computational results are discussed, and a FORTRAN computer program which implements the basic algorithm (POLKA) is exhibited. (Author)

AD-775 071/4GA PC$4.80/MF$1.45
Rand Corp Santa Monica Calif
TRADING OFF AIRMUNITION STOCKPILES AND INDUSTRIAL MOBILIZATION PRODUCTION CAPABILITY: DISCUSSION, CONCLUSIONS, AND COMPUTER PROGRAM INSTRUCTIONS,
Fred Morgan, and Mary Freeman. Jul 72, 108p Rept no. R-842/1-PR
Contract F44620-67-C-0045

Descriptors: *Combat readiness, *Military supplies, *Mobilization, Planning, Materiel, Inventory analysis, Stockpiles, Logistics, Production control, Computer programs, Air Force operations, FORTRAN.
Identifiers: SWIPE computer program, Industrial mobilization.

The report describes the problems involved in achieving a balance between stockpiles of airmunitions and their respective mobilization production capability. The report examines the elements needed by logistics planners to balance the demand (wartime consumption anticipated) and supply (WRM (War Readiness Materiel) and production anticipated) of airmunitions. It describes the computerized planning tool (SWIPE) that makes visible the by-item airmunitions position for each year of a five-year program; and evaluates the supply and demand for munitions occurring in any interim year. The report concludes with observations regarding munitions management; the appendixes contain the SWIPE computer program, and instructions for users. (Author)

AD-775 074/8GA PC$4.00/MF$1.45
Rand Corp Santa Monica Calif
VIMCOS II: A WORKLOAD CONTROL SIMULATION MODEL FOR EXPLORING MAN-MACHINE ROLES IN DECISIONMAKING,
Louis Miller. Jun 72, 80p Rept no. R-1094-PR
Contract F44620-73-C-0011

Descriptors: *Aircraft maintenance, *Management planning and control, Maintenance, Scheduling, Man machine systems, Computerized simulation, Logistics.
Identifiers: Vimcos 2 computer program, *Maintenance management, *Management information systems.

VIMCOS 2 is a prototype game for the design of management control systems in a man-machine, real-time environment, specifically, short-term resource allocation and control of aircraft maintenance resources at an airbase. Using JOSS, VIMCOS 2 demonstrates scheduling techniques, displays information, and uncovers error-handling philosophies. JOSS supplies the simulated environment, the player's information system, and aids in the scheduling task. In the abstracted environment of an airbase four events happen: aircraft land, and maintenance jobs are discovered, started, and completed. A player can devise the scenario as he proceeds or can operate against one stored in JOSS' memory. (Modified author abstract)

AD-775 233/8GA PC$4.00/MF$1.45
Logistics Management Inst Washington D C
INVESTIGATION OF THE IMPACT OF RENT-ACROSS-THE-BOARD.
Jan 74, 81p Rept no. LMI-74-7
Contract SD-321

Descriptors: *Military facilities, *Military equipment, *Leasing, *Industrial plants, Contracts, Costs, Logistics planning, Management planning and control.
Identifiers: *Rent across the board, Income, Benefit cost analysis, Sales, Taxes, Insurance.

Under Rent-Across-the-Board rent would be collected for government-owned facilities based upon mere possession by contractors regardless of amount of use on either government or commercial products. The impact of rent-across-the-board on product costs was found to be less than four percent by two methods. One method was a case study of a contractor who had bought an Industrial Reserve Plant. The second method was an analysis of 16 airframe manufacturing plants using overall cost and equipment ratios. The rental rates given in the Armed Services Procurement Regulation were examined and found to be too low and not comparable to commercial practice. The increase in administrative costs to adopt rent-across-the-board is analyzed. Finally, contractor comment on rent-across-the-board is presented and discussed. (Author)

AD-775 326/2GA PC$7.25/MF$1.45
Naval Postgraduate School Monterey Calif
PROCEEDINGS: DOD PROCUREMENT RESEARCH SYMPOSIUM (2ND). PROCUREMENT PROBLEMS. A CHALLENGE FOR PROCUREMENT RESEARCH HELD AT NAVAL POSTGRADUATE SCHOOL, MONTEREY, CALIFORNIA ON 1, 2, AND 3 MAY 1973,
Melvin B. Kline, Peter DeMayo, and Edward A. Zabrycki. May 73, 309p

Descriptors: *Military procurement, Costs, Data processing, Logistics, Symposia.

Topics discussed at the symposium were on army, navy and air force procurement, procurement research, risk analysis, cost estimating, pricing, source selection, procurement methodology and ADP applications.

AD-775 407/0GA PC$5.00/MF$1.45
Army Engineer Waterways Experiment Station Vicksburg Miss
APPLICATION OF REMOTE SENSORS TO ARMY FACILITY MANAGEMENT.
Final rept.,
Lewis E. Link, Jr., and John H. Shamburger. Feb 74, 157p Rept no. AEWES-TR-M-74-2

Descriptors: *Military facilities, *Army, *Management engineering, *Aerial photography, Aerial photographs, Management planning and control, Remote detectors, Environments, Virginia.
Identifiers: Fort Belvoir, *Remote sensing.

A study was conducted to determine the feasibility of applying remote sensing techniques to Army needs for data in environmental monitoring, resource management, and master planning at multipurpose military installations in the continental United States. The environmental data requirements for these purposes were defined, and a general assessment was made of the applicability of current photographic, thermal infrared, and microwave imaging systems to obtain these data. Aerial photographic techniques were found to be the ones most generally applicable to acquisition of data relevant to basic environmental conditions. Prototype products, consisting of maps of basic environmental conditions, cultural features, and land use were produced from aerial photography of Fort Belvoir, Virginia, and a surrounding area. (Modified author abstract)

AD-775 458/0GA PC$3.25/MF$1.45
Amc Inventory Research Office Philadelphia Pa
THE USE OF FORCE STRUCTURE INFORMATION IN DETERMINING SECONDARY ITEM REQUIREMENTS.
Final rept.,
Bruce A. Kirkpatrick, and W. Karl Kruse. Jan 73, 43p

Descriptors: *Logistics, *Inventory control, Military supplies, Management planning and control, Management information systems, Inventory analysis.
Identifiers: *Logistics management, *Force structure.

Various Army Materiel Command Headquarters personnel have observed apparent lags in adjusting Secondary item stockage levels consistent with Force changes. The obvious result is weakened supply effectiveness and excessive operating costs. The report is a qualitative analysis of the timeliness and validity of end item density data used by wholesale and overseas Command Supply Management. The process examined begins with the Department of the Army Force specification and terminates with the end item density entry into Supply Control Studies. A limited analysis is also made of Overseas Command procedures for force change reaction. (Author)

15G. Operations, Strategy, and Tactics

AD-775 578/8GA PC$4.25/MF$1.45
Army War Coll Carlisle Barracks Pa
WAR GAMES AND THE COMPUTER.
Student essay,
Allan C. Torgerson. 14 Oct 70, 22p

Descriptors: *War games, Reviews.

The essay examines computer usage in certain war game applications. The classifications or types of war games are explained. A brief history of war games and how the gaming of operational war plans came into being is developed. Costs in man-hours and dollars to conduct war games are examined, and model limitations are presented. (Modified author abstract)

N74-15670/4GA PC$3.00/MF$1.45
Research Inst. of National Defence, Stockholm (Sweden).
FUTURE CHOICE OF WEAPONS AND TARGETS: TECHNICAL POSSIBILITIES AND RESTRICTIONS.
L. Tammelin. Nov 73, 7p FOA-1-B-1284-M5, ISBN-91-7056-025-0

Descriptors: *Ammunition, *Nuclear weapons, *Weapon systems, Air defense, Chemical warfare, Incendiary ammunition, Target acquisition, Weapon system management.

For abstract, see STAR 1206

16. MISSILE TECHNOLOGY

16C. Missile Warheads and Fuses

AD-774 844/5GA PC$10.50/MF$1.45
Martin Marietta Aerospace Orlando Fla
EVALUATION OF THE CONAP (CONTROLLED ATMOSPHERIC PROTECTED SYSTEM) CONCEPT FOR ADVANCED ABM NOSE TIPS.
Final rept. 24 Oct 72-24 Oct 73,
Archie Ossin, and Don M. Cawthon. Jan 74, 149p Rept no. OR-12840 AMMRC-CTR-74-1
Contract DAAG46-73-C-0053

Descriptors: *Nose tips, *Antimissile defense systems, *Ablative materials, Nose cones, Surface to air missiles, Cooling, Ammonia, Heat transfer, Tungsten, Aerodynamic heating, Computer programs, FORTRAN.
Identifiers: FORTRAN 4 programming language.

The document reports the results of a twelve month research study of a transporation-cooling system concept having application to the nose tip and control surface leading edges of an advanced ABM. The concept uses a reactive gas coolant and a hot wall matrix. Testing has been conducted to determine the permeability and inertial resistance coefficients of candidate refractory porous and discrete hole matricies. Testing was also conducted to determine the amount of heat transferred from the hot matrix to the coolant gas. The results show that system weight savings would be realized from use of the CONAP concept when compared to a water system. The data taken have been correlated with curve fits and used to conduct preliminary concept design analyses. (Author)

16D. Missiles

AD-775 111/8GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
SHARPSHOOTERS,
K. Erhart. 8 Jan 74, 12p Rept no. FTD-HC-23-825-74
Edited trans. of Armee Rundschau (East Germany) n7 p52-57 1973.

Descriptors: *Guided missiles, *USSR, Periodicals, Translations, Guided missile launchers, Guided missile silos, East Germany.

The brief translation concerns Soviet strategic missiles and missile complexes.

AD-775 300/7GA PC$4.00/MF$1.45
Naval Weapons Lab Dahlgren Va
AERODYNAMICS OF GUIDED AND UNGUIDED WEAPONS. PART II. COMPUTER PROGRAM AND USAGE.
Technical rept.,
Frank G. Moore, and C. William McKerley. Jan 74, 175p Rept no. NWL-TR-3036
See also Part 1, AD-770 852.

Descriptors: *Rockets, *Guided missiles, *Computer programs, *Aerodynamic characteristics, Wing body configurations, Lift, Aerodynamic drag, Fluid flow, FORTRAN, User needs.

The report describes a computer program for calculating static forces and moments on canard-body-tail configurations. The program is applicable in the Mach number range, 0 = or < (M sub infinity) = or < 3, and angle of attack range, 0 = or < alpha < 20 degrees. The theoretical development of the methods used in the program is given in Part I of the report; however, for reference purposes, the various theories used are listed herein. A detailed description of the program usage, including input and output quantities, is also given. Several example cases are considered and the calculated aerodynamics compared with experimental data. In general, accuracies of plus or minus 10% can be expected for normal force and drag and the center of pressure is expected to be accurate to within plus or minus 8% of the body length. (Modified author abstract)

AD-775 303/1GA PC$5.50/MF$1.45
Naval Ordnance Lab White Oak Md
PLANFORM INPUT GENERATOR (PING), A NASTRAN PROCESSOR FOR LIFTING SURFACES-THEORETICAL DEVELOPMENT, USER'S MANUAL, AND PROGRAM LISTING.
Technical rept. Jul 71-Jun 73,
Pao C. Huang, and John P. Matra, Jr. Dec 73, 185p Rept no. NOLTR-73-199

Descriptors: *Lifting surfaces, *Computer programs, Planform, Structural properties, Preprocessing, FORTRAN, Computer applications, User needs, Guided missiles.
Identifiers: PING Computer program, LIMIT project, NASTRAN computer program, Finite element analysis, Computer aided design.

The Planform Input Generator (PING) presented in this report is pre-processor for NASTRAN analysis of lifting surfaces. Using PING, finite element models can be automatically generated and NASTRAN bulk data cards punched, thus enabling a complicated structure to be accurately and rapidly analyzed. General theoretical development user's manual, program listing and sample problems are included in the report. (Author)

AD-775 354/4GA PC$3.00/MF$1.45
Royal Aircraft Establishment Farnborough (England)
A COMPARISON OF TWO METHODS OF CONSTRUCTING THE OPTIMAL TRANSFER FUNCTION FOR A SIMPLIFIED GUIDED-WEAPON SYSTEM.
Technical memo.,
L. J. Richards, and M. R. Abbott. Jul 73, 17p Rept no. RAE-TM-Math-7303 DRIC-BR-37523

Descriptors: *Guided missiles, *Control theory, Transfer functions, Kalman filtering, Optimization, Great Britain.
Identifiers: Wiener filters, Time invariant systems.

An optimum transfer function for a line-of-sight guided weapon system is found by two methods, a frequency domain method and a time domain method. It is shown that the two transfer functions are identical.

AD-775 357/7GA PC$15.75/MF$1.45
Philco-Ford Corp Newport Beach Calif Aeronutronic Div
MODULAR WEAPON SYSTEM AERODYNAMIC CONFIGURATION AND COMPONENT DEFINITION STUDY.
Final rept. Oct 72-Apr 73,
Arthur Nitikman, John Moore, George Fulton, James Putman, and Alson Frazer. May 73, 253p
AFATL-TR-73-120
Contract F08635-73-C-0041

Descriptors: *Air to surface missiles, *Aerodynamic configurations, Modular construction, Terminal guidance, Interfaces, Canard configuration, Wind tunnel models, Computerized simulation.
Identifiers: Mark-84 bombs(2000-lb.), SUU-54 dispensers, SUU-51 dispensers, Modular weapons.

The report documents a study which updates the aerodynamic configuration, subsystem design characteristics, and interface definition of a modular family of air-to-surface weapons which were defined in a preceding study. The revised Modular Weapon System (MWS) family makes use of existing production and development hardware including a series of terminal guidance modules which are also fully compatible with the modular Maverick family. Other modules employed in the family include the Aimpoint and/or Pave Storm 3 optical correlation guidance, the SUU-54, MK84 and HSM warheads, plus a modified Thiokol TU-686 rocket motor for propulsion. The design optimization and interface definition was optimized for a direct attack mode having standoff ranges up to 20 nautical miles. (Modified author abstract)

AD-775 486/4GA PC$3.75/MF$1.45
Illinois Univ Urbana Gas Dynamics Lab
SIDE VECTOR CONTROL THROUGH JET WALL INTERACTIONS IN SEGMENTED EJECTOR NOZZLES.
Final rept.,
H. H. Korst, and R. A. White. Sep 73, 53p
Contract DAAH01-72-C-0781

Descriptors: *Ejectors, *Thrust vector control systems, Guided missiles, Control jets, Jet flow, Flow fields, Flow separation, Base flow.

It has been suggested that a non-symmetrical supply of secondary air to an ejector nozzle and consequent deflections of the primary jet could be used as a method of side vector control. Experimental support for this scheme has been sought; however, it did not indicate that significant side forces could be achieved. The investigation aimed at the theoretical analysis and experimental verification of side vector forces produced in segmented short-shroud ejectors by controlled admission of secondary air.

SLA-73-899 PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
PARTIAL COMPARISON BETWEEN THE SIMILARITY AND SUMMATION TECHNIQUES FOR MULTIPLE-BURST INTERACTIONS.
D. A. Dahlgren. Nov 73, 20p
Contract AT(29-1)-789

Descriptors: (*Missiles, *Shock waves), Analytical solution.

For abstract, see NSA 29 05, number 12483.

17. NAVIGATION, DETECTION, COMMUNICATIONS, AND COUNTERMEASURES

17A. Acoustic Detection

AD-774 907/0GA PC$3.00/MF$1.45
Naval Ordnance Lab White Oak Md
FLUCTUATIONS IN SONAR: A SHORT SURVEY.
Final rept.,
R. J. Urick. 19 Nov 73, 25p Rept no. NOLTR-73-217

Descriptors: *Sonar signals, Signal to noise ratio, Ambient noise, Background noise, Marine biological noise, Underwater sound, Sound transmission, Variations, Reviews.
Identifiers: Underwater ambient noise.

Sonar fluctuations recieved intensive study during the hectic days of World War II, when the causes of fluctuation were identified and some quantitative data was obtained at the frequencies and ranges of current interest. Since then, in the search for mean values of the sonar parameters, fluctuations have tended to be neglected as a subject of serious study. They are the results of the mobile, varying nature of the medium and the objects within it. For example, echoes fluctuate because of the constantly changing heading of a submarine underway; the ambient background fluctuates because of changing ship traffic, wind speed and biological activity; CW signals fluctuate because of a changing multipath structure of the medium. Examples of these effects, as observed in NOL field work, will be presented. Their effect on detection is to improve detection at low mean S/N ratios and to cause lost contacts at high S/N ratios. Quantitatively, this behavior can be expressed by means of ROC curves modified to include fluctuations. However, much more work needs to be done on the second-order statistics of underwater sound before their magnitude can be predicted and their effects understood. (Author)

AD-775 038/3GA PC$8.25/MF$1.45
Naval Postgraduate School Monterey Calif
DIGITAL PROCESSING OF ACOUSTIC SIGNALS WITH APPLICATION TO AN ASW SIGNAL PROCESSOR.
Master's thesis,
Vance Erick Adler. Dec 73, 102p

Descriptors: *Antisubmarine warfare, *Acoustic detection, *Underwater sound, *Signal processing, Acoustic signals, Ambient noise, Fourier transformation, Digital systems, Spectrum analysis, Theses.
Identifiers: Underwater ambient noise.

There is a growing need within the Navy for methods for detecting discrete narrowband signals in a non-stationary background. This paper concerns itself with the application of digital processing and spectral analysis techniques toward that goal. The use of the fast Fourier Transform in estimating the power spectrum of a signal is described. The method involves sectioning the time record, making 'raw' estimates of the spectrum from these sections, and averaging these 'raw' estimates. It is shown that more stable estimates are available if the segments are overlapped and an optimum amount of overlap for the case of the Hanning window is found. It is shown that the stability of these spectral estimates can be interpreted as processing gain in the case of a discrete narrowband signal in additive noise. And finally, a brief description of signal detection theory applied to a human observer is presented to emphasize the flexibility that a human operator can bring to a signal detection system. (Author)

AD-775 287/6GA PC$3.00/MF$1.45
Naval Underwater Systems Center New London Conn New London Lab
THE PARAMETRIC RADIATOR AS A WIDEBAND CALIBRATION SOURCE.
Technical rept.,
William L. Konrad, and Joseph G. Navin. 14 Jan 74, 15p Rept no. NUSC-TR-4645

Descriptors: *Hydrophones, *Calibration, Sound generators.

The parametric, or difference frequency, radiator appears to offer advantages over conventional facilities used for hydrophone calibration: wide bandwidth from a single transducer, narrow beamwidths, and short pulse lengths. The combination of these characteristics promises simplification of calibration procedures and elimination or reduction of boundary-reflection problems. Experiments described measured the parametric-radiator performance for calibration purposes and highlighted its inherent problems. (Author)

AD-775 563/0GA Reprint
Wisconsin Univ Madison Dept of Geology and Geophysics
TRANSFORMATION OF SIDE-SCAN SONAR RECORDS TO A LINEAR DISPLAY.
Geophysics and polar research,
J. M. Berkson, and C. S. Clay. 1973, 7p Rept no. Contrib-292
Sponsored in part by the Office of Naval Research, Arlington, Va.
Availability: Pub. in International Hydrographic Review, v50 n2 p55-59 Jul 73.

Descriptors: *Side looking sonar, *Sonar signals, *Signal processing, Distortion, Corrections.
Identifiers: Sonar images, Image processing.

A procedure for removing the linear and nonlinear distortion in side scanning sonar records is described. The sonographs are placed on one rotating drum and optically scanned. The optical signal is converted to an electrical voltage and marks an electrosensitive paper on the second drum. The two drums have a common shaft and rotate together. The position and rate of scan of the marking stylus is controlled to remove the distortion. An expamle of a distorted and corrected sonograph is shown. (Author)

17B. Communication

AD-774 840/3GA PC$8.00/MF$1.45
Army Engineer Topographic Labs Fort Belvoir Va
THE PROPAGATION OF VERY SHORT RADIO WAVES THROUGH THE IONOSPHERE AND THE INVESTIGATION OF IONOSPHERIC MODELS.
Research note,
Frederick W. Rohde. Aug 73, 359p Rept no. ETL-RN-74-1

Descriptors: *Ionospheric propagation, Very high frequency, Radio waves, Ionosphere, Models, Radio transmission.
Identifiers: SECOR, Defense navigation satellite system.

The Research Note deals with propagation phenomena of very short radio waves in the ionosphere as they occur in radio links between earthbound stations and satellites. It is shown how the propagation of radio waves is affected by the ionosphere and how radio range measurements have to be treated in order to obtain the geometrical distance between the terminals of the radio link. Radio waves of several frequencies (225 MHz, 420 MHz, 450 MHz, and 1600 MHz) are quantitatively discussed, because these frequencies relate to the Sequential Collation of Range (SECOR) System and to the proposed Defense Navigation Satellite System (DNSS).

AD-774 960/9GA Reprint
Harvard Univ Cambridge Mass Psycho-Acoustic Lab

THE INTELLIGIBILITY OF AMPLITUDE-DICHOTOMIZED, TIME-QUANTIZED SPEECH WAVES,
J. C. R. Licklider. 3 Aug 50, 5p Rept no. PNR-98
Contract N5ori-76
Prepared in cooperation with Massachusetts Inst. of Tech., Cambridge. Acoustics Lab. Sponsored in part by Air Force Cambridge Research Labs., L. G. Hanscom Field, Mass.
Availability: Pub. in Jnl. of the Acoustical Society of America, v22 n6 p820-823 Nov 50.

Descriptors: *Speech recognition, *Voice communications, Sound waves, Sound transmission, Acoustic measurement, Intelligibility.

The paper describes two ways of reducing the normally very complicated speech wave to simple geometrical form without destroying intelligibility, reports the results of articulation tests of the simplified speech, and gives two illustrations of things that can be done more simply with the simplified than with the normal wave. Both methods of simplification involve dichotomization of the amplitude scale and then quantization of the time scale. The first step is achieved by subjecting the speech wave to infinite peak clipping, the second by generating a rectangular wave whose switchings from one amplitude level to the other are related to the switchings of the clipped speech wave by one or the other of two rules. One of the rules yields marginal intelligibility with quanta 0.2 millisecond in length; the other requires slightly shorter quanta. The relative merits of the two methods are accounted for by an elementary application of information theory. Autocorrelation functions, which are especially easy to compute for the simplified waves, are shown.

AD-775 013/6GA PC$6.00/MF$1.45
Naval Postgraduate School Monterey Calif
A VIDEO BANDWIDTH COMMUNICATIONS SYSTEM UTILIZING OPTICAL FIBER TRANSMISSION.
Master's thesis,
Gary Michael Lockhart. Dec 73, 59p

Descriptors: *Optical communications, *Fiber optics transmission lines, Broadband, Light emitting diodes, Gallium arsenide lasers, Photodiodes, Theses.
Identifiers: Design.

A video bandwidth communications system utilizing optical fiber transmission was designed, constructed, and tested. An amplitude modulated gallium arsenide light emitting diode is driven by a transistor circuit. The output is detected by a wide bandwidth silicon detector-preamplifier hybrid circuit. Properties such as bandwidth and harmonic distortion were measured for the individual system elements and the overall system. A closed circuit television signal was sent through the system and a sharp clear picture was observed on the monitor. (Author)

AD-775 139/9GA PC$4.50/MF$1.45
Massachusetts Inst of Tech Lexington Lincoln Lab
A LOCALLY ORGANIZED PARSER FOR SPOKEN INPUT.
Technical rept.,
Perry L. Miller. 2 May 73, 121p Rept no. TR-503 ESD-TR-73-98
Contract F19628-73-C-0002, ARPA Order-2006

Descriptors: *Speech recognition, Phonology, Man machine systems, Speech.
Identifiers: Phonemes, *Parsing, LPARS system.

The report describes LPARS, a locally organized parsing system designed to recognize continuous speech, accepting as its input a string of phonemes which contains ambiguity and error. LPARS is locally organized in the sense that it can construct local parse structures from word candidates found in all parts of the input utterance. These local structures are used as 'islands of reliability' and, together with syntactic and semantic information, guide the search for words to complete the utterance. (Author)

AD-775 142/3GA PC$3.75/MF$1.45
Mitre Corp Bedford Mass
ESTIMATING THE COMMUNICATIONS COVERAGE FOR UHF GROUND-TO-AIR RADIO SYSTEMS.
Technical rept.,
A. J. Desrosiers. Jan 74, 53p Rept no. MTR-2716 ESD-TR-73-353
Contract F19628-73-C-0001

Descriptors: *Ground to air communications, Ultrahigh frequency, Line of sight, Radio transmission, Communication and radio systems, Systems analysis, Computerized simulation.

Estimating the coverage which can be obtained for reliable line-of-sight ground-to-air communications is difficult when relatively low power transmitters are employed and significant multipath fading is anticipated. An analysis and computer simulation of this problem is presented which can be used to determine coverage area as a function of many variables which include site elevation, aircraft altitude, type of terrain, polarization, frequency, and antenna characteristics. The propagation effects of refraction and divergence at small angles with respect to the horizon are included in the analysis. (Author)

AD-775 163/9GA PC$4.00/MF$1.45
Kansas Univ/Center for Research Inc Lawrence
A STUDY OF (AFCS) COMMUNICATIONS MEASUREMENT PROGRAM.
Final rept. 18 Feb 72-18 Feb 73,
A. M. Breipohl, K. Sam Shanmugam, and Harvey Doemland. Nov 73, 95p RADC-TR-73-312
Contract F30602-72-C-0229

Descriptors: *Radio receivers, Mathematical models, Modulators, Noise(Electrical and electromagnetic), Microwave communications, Computerized simulation, Computer programs.

The objective of this work was to study the current measurement procedures used by the Air Force Communications Service (AFCS) for monitoring the performance capabilities of the microwave communications systems used by the Air Force and to develop additional measurement procedures to supplement the current procedures. The approach used to achieve the objectives consists of developing simple mathematical models for the various functional blocks in the communication system, selecting a set of important parameters of the model, relating values of functional block parameters to communications systems parameters, and developing procedures for measuring the values of these parameters. (Author)

AD-775 203/3GA PC$4.25/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
THE STATE AND PROSPECTIVES OF THE DEVELOPMENT OF TONAL TELEGRAPHY,
B. V. Korop, and L. I. Yaroslavskii. 20 Feb 74, 22p Rept no. FTD-HT-23-564-74
Edited trans. of Elektrosvyaz (USSR) n4 p71-78 Apr 73, by Michael L. Seidel.

Descriptors: *Telegraph systems, Telegraph equipment, Multichannel communications, Audio tones, Translations, USSR.
Identifiers: Tonal telegraphy.

Contents: Introduction; general characteristics of the equipment; types and parameters of TT channels; local telegraph circuit parameters; equipment design; prospects of the development of TT systems.

AD-775 219/9GA PC$7.00/MF$1.45
System Development Corp Santa Monica Calif
REPORT OF THE CACTOS PROJECT: INVESTIGATION OF COMPUTATION AND COMMUNICATION TRADE-OFFS IN MILITARY COMMAND AND CONTROL SYSTEMS.
Final rept.,
G. M. Cady, B. P. Lientz, M. Pillon, and N. E. Willmorth. 1 Sep 72, 77p Rept no. SDC-TM-4743/013/00
Contract DAHC15-67-C-0149, ARPA Order-1327

Descriptors: *Command and control systems, *Communications networks, Computers, Networks, Cost effectiveness, Time sharing, Computations, Network flows, Computer programming, FORTRAN.
Identifiers: *Computer networks, CACTOS(Computation and Communication Trade Off Studies), Computation and communication trade off studies.

The report describes a group of experiments whose purpose was the expansion, refinement, and validation of the CACTOS computer-network analysis model. The experiments were conducted on both existing and planned computer networks in order to arrive at conclusions with respect to computation resources and to obtain guidelines for use in the design, construction, and modification of computer networks. The primary issue investigated was the question of whether, in general, centralized or decentralized (distributed) computational power offers the best potential performance and cost-effectiveness for present and future computer network configurations. The conclusion was that partial decentralization, using large computers to achieve economies of scale, provides optimum results for the types of computer networks that will be constructed to meet the needs of the Department of Defense during the 1975-1980 time period. (Author)

AD-775 234/8GA PC$5.00/MF$1.45
Naval Undersea Center San Diego Calif
IMAGE TRANSMISSION VIA SPREAD SPECTRUM TECHNIQUES.
Quarterly technical rept., 1 Jun-1 Oct 73,
Robert W. Means, Jeffrey M. Speiser, and Harper J. Whitehouse. 1 Oct 73, 151p
ARPA Order-2303
See also AD-765 327.

Descriptors: Television systems, *Spread spectrum, Images, Tactical communications, Coding, Fourier transformation, Remotely piloted vehicles, Television equipment.

The report describes the progress on second phase of a program on image bandwidth reduction for application to the ARPA remotely piloted vehicle (RPV) problem of sending television images over spread spectrum channels. The report details the first quarter of a hardware development and implementation phase. Hardware was constructed to perform linear transformations on the television signal. Both surface acoustic wave and charge transfer devices were built and tested. It was decided to proceed with charge transfer devices for the final design. The study of performance tradeoff as a function of block size and transform was continued. It was determined that a Cosine transform together with a differential pulse code modulation (DPCM) transform in the second dimension offers near optimal performance. A principal result of this quarter is the determination that the DPCM and Cosine mixed transform are an optimal performance system. A second result is that charge transfer device hardware has been built which approximates the final prototy e hardware.

AD-775 301/5GA PC$3.00/MF$1.45
Navy Experimental Diving Unit Washington D C
OPERATIONAL EXPERIENCES WITH AND REASONS FOR REMOVAL OF THE CLOSED CIRCUIT TELEVISION AND WETPOT TV CAMERA POSITIONING SYSTEMS INSTALLED IN THE NAVXDIVINGU HYPERBARIC COMPLEXES AUGUST 1968 TO JUNE 1971.
Final rept.,

Stephen D. Reimers. 25 Jan 74, 22p Rept no. NEDU-3-74

Descriptors: *Closed circuit television, Hyperbaric chambers, Atmospheres, Helium, Television cameras, Reliability(Electronics), Failure(Electronics).

In late 1968 a closed circuit televeision system was installed in the hyperbaric complexes at the Navy Experimental Diving Unit. The system used cameras mounted inside the hyperbaric chambers with external monitors and power supplies. The two cameras installed in the wetpots of the hyperbaric complexes were mounted on remotely controlled positioning systems capable of vertical movement and horizontal pan. The operational experiences with the closed circuit TV system and the wetpot TV camera positioners are described. Also described are the reasons why, in 1971, both systems were removed as a direct consequence of unreliable performance. (Author)

AD-775 375/9GA PC$7.25/MF$1.45
Martin Marietta Aerospace Orlando Fla Communications and Electronics Div
AREA NODAL COMMUNICATIONS INVESTIGATION.
Final technical rept. Jan-Jul 73,
T. L. Duffield, J. C. Wiltse, and W. L. Elden. Nov 73, 309p Rept no. OR-12744 RADC-TR-73-341
Contract F30602-73-C-0147

Descriptors: *Data transmission systems, Communication and radio systems, Millimeter waves, Optical communications, Digital systems, Data links, Radio links, High rate, Modular construction, Tactical communications, Time division multiplexing, Switching, Trade off analyses, Reliability, Short range.

A comprehensive study of the capabilities in the millimeter wave and optical portions of the electromagnetic spectrum in an intrabase communications system environment was conducted, and the relative metits of each technology compared to developed the optimum intrabase communications system for postulated rapidly deployed command posts. The approach pursued was to compare the two technologies in a typical base deployment for projected communications needs of the 1980's. The investigation is based on a system composed of several hundred subscribers and several terminals. It considers systems that use information bandwidths in excess of 300 MHz and operate at maxmum ranges of 10 kilometers with 99.9 percent all-weather reliability. (Modified author abstract)

AD-775 402/1GA PC$3.25/MF$1.45
Cincinnati Electronics Corp Ohio
RADIO SET AN/PRC-70( ).
Quarterly rept. no. 7, 1 Jan-31 Dec 73,
C. A. Bucher. Feb 74, 36p Rept no. 80045-PRC-39/174 ECOM-0319-7-71
Contract DAAB07-71-C-0319
See also report dated Apr 73, AD-759 953.

Descriptors: *Transmitter receivers, Portable equipment, High frequency, Very high frequency, Tuning devices, Power amplifiers, Frequency synthesizers, Modules(Electronics).
Identifiers: AN/PRC-70.

The report covers four quarterly intervals from 1 January 1973 through 31 December 1973. The effort during this calendar period has been directed primarily toward testing and troubleshooting of the engineering model. Appropriate design modifications growing out of this work were concurrently incorporated in the hardware under construction and the documentation for the ET/ST models. Highlight areas of the debugging and troubleshooting activities for this calendar period have been in the antenna coupler, receiver spurious responses and transmitter intermodulation. Construction and test of modules and subassemblies for the first group of three ET/ST models has also been a significant activity during this period. (Author)

AD-775 501/0GA Reprint
Army Electronics Command Fort Monmouth N J
CONTINUOUS SPEECH DATA BASE WITH 14 MARKED VOWEL AND NASAL CLASSES,
Harris Drucker. 10 May 73, 4p
Revision of report dated 27 Feb 73.
Availability: Pub. in the Jnl. of the Acoustical Society of America, v54 n2 p541-543 1973.

Descriptors: *Speech recognition, *Phonology, Computer applications.
Identifiers: *Phonemes.

One of the problems in the design of continuous speech recognition systems is evaluation of the stage which detects occurrences of phonemes in the speech signal. A method of evaluating and optimizing phoneme recognition networks has been developed which uses data obtained by manual 'marking' of phoneme locations on a tape recording of speech. With the aid of a digital computer and display, 1090 occurrences of vowels, nasals, and 'don't care' conditions were marked in a five-minute sample of speech. These data, which may be used for measurement of error rates in speech recognition systems, have been included in the IEEE Computer Society repository for data bases. (Author)

COM-74-50185/9GA PC-GPO/MF$1.45-NTIS
Office of Telecommunications, Boulder, Colo. Inst. for Telecommunication Sciences.
NECESSARY BANDWIDTHS FOR FREQUENCY-MODULATED MICROWAVE RADIO RELAY SYSTEMS.
Telecommunications research and engineering rept.,
Hiroshi Akima. Feb 72, 17p OT/TRER-26
Paper copy available from GPO $0.30.

Descriptors: *Microwave relay systems, Bandwidth, Frequency modulation, Multiplexing, Numerical analysis.

A method for determining the necessary bandwidth for a frequency-modulated (FM) microwave radio relay system that is equipped with a continuity pilot is described. A set of values necessary for determining the peak frequency deviation in an FM system that transmits a frequency-division-multiplexed (FDM) telephony signal and those for the level of a uniform-spectrum signal that approximates an FDM telephony signal are given. (Author)

KFK-PDV-7 PC$5.75/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany).
POSSIBILITIES AND LIMITATIONS OF AUTOMATIC SPEECH RECOGNITION FOR COMMAND INPUT IN CONTROL ROOMS.
F. Quante. Jul 73, 72p
In German. U.S. Sales Only.

Descriptors: (*Speech, *Discriminators), (*Noise, *Electric filters), (*Control systems, *Sound waves), Computers, Control, Filtration, Pharynx, Programming, Signals.

For abstract, see NSA 29 05, number 12463.

N74-14890/9GA PC$10.75/MF$1.45
Stanford Univ., Calif. Center for Radar Astronomy.
OPTIMIZATION IN THE DESIGN OF A 12 GIGAHERTZ LOW COST GROUND RECEIVING SYSTEM FOR BROADCAST SATELLITES. VOLUME 1: SYSTEM DESIGN, PERFORMANCE, AND COST ANALYSIS.
Final Report.
K. Ohkubo, C. C. Han, J. Albernaz, J. M. Janky, and B. B. Lusignan. 15 Oct 72, 171p NASA-CR-121184-VOL-1
Contract NAS3-14362

Descriptors: *Communication satellites, *Cost analysis, *Ground support equipment, *Receivers, *Systems engineering, Breadboard models, Frequency modulation, Integrated circuits, Microwave equipment, Performance prediction.

For abstract, see STAR 1206

N74-14891/7GA PC$12.00/MF$1.45
Stanford Univ., Calif. Center for Radar Astronomy.
OPTIMIZATION IN THE DESIGN OF A 12 GIGAHERTZ LOW COST GROUND RECEIVING SYSTEM FOR BROADCAST SATELLITES. VOLUME 2: ANTENNA SYSTEM AND INTERFERENCE.
Final Report.
K. Ohkubo, C. C. Han, J. Albernaz, J. M. Janky, and B. B. Lusignan. 15 Oct 72, 198p NASA-CR-121184-VOL-2, SU-SEL-72-043-VOL-2
Contract NAS3-14362

Descriptors: *Antenna design, *Communication satellites, *Ground support systems, *Receivers, Antenna feeds, Antenna radiation patterns, Cost analysis, Electromagnetic interference.

For abstract, see STAR 1206

N74-14892/5GA PC$4.50/MF$1.45
Stanford Univ., Calif. Inst. for Communication Research.
TESTING AND ASSESSMENT OF CO-CHANNEL VIDEO INTERFERENCE ON TELEVISION, ATTACHMENT 1.
Final Report.
R. H. Miller. May 72, 49p NASA-CR-121184-ATT-1
Contract NAS3-14362

Descriptors: *Frequency modulation, *Radio frequency interference, *Television systems, Signal to noise ratios, Television transmission, Video equipment, Visual perception.

For abstract, see STAR 1206

N74-14894/1GA PC$4.25/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
RADIOCOMMUNICATIONS FOR METEOROLOGICAL SATELLITE SYSTEMS.
B. A. Walton. Dec 73, 42p NASA-TM-X-70565, X-120-73-388

Descriptors: *Meteorological satellites, *Radio communication, Improved tiros operational satellites, Meteorological instruments, Nimbus satellites, Tiros satellites.

For abstract, see STAR 1206

N74-14896/6GA PC$15.00/MF$1.45
Computer Sciences Corp., Falls Church, Va.
FREQUENCY MODULATION TELEVISION ANALYSIS: DISTORTION ANALYSIS.
Final Report, Sep. 1972 - Nov. 1973.
W. H. Hodge, and W. H. Wong. 26 Nov 73, 258p NASA-CR-132895, REPT-3007-2
Contract NAS5-21872

Descriptors: *Computerized simulation, *Frequency modulation, *Signal distortion, *Television transmission, *Waveforms, Electronic filters, Signal transmission, Time division multiplexing.

For abstract, see STAR 1206

N74-15149/9GA PC$25.75/MF$1.45
McDonnell-Douglas Astronautics Co., St. Louis, Mo.
HIGH DATA RATE OPTICAL TRANSCEIVER TERMINAL.
Final Report, 30 Jun. 1972 - 26 Jan. 1973.
E. S. Clarke. May 73, 471p NASA-CR-132896
Contract NAS5-23154

Descriptors: *Optical communication, *Optical data processing, *Transmitter receivers, High altitude balloons, Ionospheric propagation.

For abstract, see STAR 1206

17E. Infrared and Ultraviolet Detection

AD-775 213/2GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
SILICON SCHOTTKY RETINAS FOR INFARED IMAGING,
F. D. Shepherd, and A. C. Yang. 1973, 5p Rept no. AFCRL-TR-74-0067
Availability: Pub. in IEDM Technical Digest, p310-313 1973.

Descriptors: *Infrared detectors, *Schottky barrier devices, Semiconductor diodes, Silicon, Photodiodes.
Identifiers: *Infrared cameras.

Silicon schottky barrier diode arrays, operating in a high sensitivity storage mode, provide the basis for a new class of IR imaging sensor. A Pd on p-Si retina which has a wavelength dependent quantum efficiency from 1 to 3.5 micrometers is described. This device has a noise equivalent temperature of .17K against a 300K background. The operating temperature is 120K and retina nonuniformities cause negligible reduction in sensitivity. (Author)

17G. Navigation and Guidance

AD-774 790/0GA PC$3.25/MF$1.45
Army Electronics Command Fort Monmouth N J
INJECTION LASER TERRAIN FOLLOWING SYSTEM (ILTFS).
Technical rept.,
E. Schiel, R. Gammarino, A. Kleider, and E. Aras. Feb 74, 27p Rept no. ECOM-4197

Descriptors: *Helicopters, *Terrain avoidance, Navigational aids, Injection lasers, Low level, Performance(Engineering).
Identifiers: Terrain following.

A model has been developed of a subsystem designed to sense the trend of the terrain ahead of low flying rotary wing aircraft. This sensor subsystem, a forerunner of a terrain following system, incorporates a high peak power injection laser transmitter and an optical receiver with a high sensitivity silicon avalanche detector. In operation, the slant range from the aircraft to the terrain is continuously measured to sense terrain variations. Experimental data have confirmed the results of a performance analysis which indicates that the system is capable of determining the terrain trend at a horizontal range of 300 m along the aircraft flight vector under background limited conditions. (Author)

AD-774 891/6GA PC$4.00/MF$1.45
Naval Electronics Lab Center San Diego Calif
OMEGA ENVELOPE CAPABILITY FOR LANE RESOLUTION AND TIMING.
Research and development rept., Jun 72-Nov 73,
E. R. Swanson, and D. J. Adrian. 20 Nov 73, 88p Rept no. NELC-TR-1901

Descriptors: *Radio navigation, *Sea rescues, *Rescue equipment, Hyperbolic navigation, Very low frequency, Transmitter receivers, Global, Feasibility studies, Position finding, Locators, Signal to noise ratio, Radiation.
Identifiers: Omega navigation system.

Reports on an investigation of the feasibility of using Omega pulse envelopes for resolving the Omega lane ambiguity--for sea-air rescue and other navigation and timing applications, Navy and civil. Pulse arrival time measurement accuracy is related to pulse rise time and signal-to-noise ratio (SNR). Required accuracies for three- and four-frequency transmission formats are determined and related to expected SNR. Lane resolution from pulse envelopes is shown to be feasible with a four-frequency signal format. Signal relay times of three minutes or less are required in heavy noise for 0.95 confidence of position location. Preliminary experimental results support calculations. (Author)

AD-774 912/0GA PC$5.00/MF$1.45
Naval Weapons Lab Dahlgren Va
ANALYSIS OF NAVIGATION ERROR SOURCES FOR THE TIMATION DNSS (DEFENSE NAVIGATION SATELLITE SYSTEMS) OPTION.
Technical rept.,
Everett R. Swift. Nov 73, 37p Rept no. NWL-TR-3067

Descriptors: *Navigation satellites, Satellite networks, Global, Navigation, Accuracy, Errors.
Identifiers: TIMATION(Time Navigation), Time navigation, Defense navigation satellite system.

The proposed Defense Navigation Satellite System (DNSS) (called TIMATION by the Naval Research Laboratory) was evaluated in terms of aspects relating directly to the navigation performance of the System. Three areas were examined: configuration stability; orbit determination and prediction accuracy; and navigation. The first two areas were evaluated in terms of their effects on navigation accuracy. The error sources considered included gravity field modeling, Earth tides modeling, radiation pressure modeling, and observation biases and precision. The major error sources for navigation using the TIMATION system are radiation pressure modeling and the degree of synchronization of the satellites' clocks. (Modified author abstract)

AD-775 069/8GA PC$4.25/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
STUDY OF SOURCE LOCATION ERROR BY COMPUTER SIMULATION.
Physical sciences research papers,
K. Toman, and J. E. Martine. 6 Nov 73, 24p Rept nos. AFCRL-73-0684, AFCRL-PSRP-574

Descriptors: *Position finding, Position(Location), Networks, Errors, Iterations, Radio signals, Measurement, Computerized simulation, Radar tracking.
Identifiers: Time of arrival.

The location of sources of waves propagating with unknown speed above (electromagnetic, infrasonic, acoustic-gravity wave) or below (seismic wave) the surface of the earth may be deduced from time-of-arrival measurements made at four synchronized stations. In order to determine how errors in arrival time relate to errors in source location and signal velocity, a computational procedure was developed. The latter is aimed at finding the optimum network configuration for determining the most probable source location and velocity of a propagating signal from given errors of time-of-arrival measurements. (Modified author abstract)

AD-775 258/7GA PC$5.75/MF$1.45
Johns Hopkins Univ Silver Spring Md Applied Physics Lab
ANGEL CLUTTER AND THE ASR AIR TRAFFIC CONTROL RADAR. VOLUME I. STUDY RESULTS.
Final rept. Oct 71-Feb 73,
J. R. Barry, B. K. Carter, R. J. Erdahl, R. L. Harris, and J. T. Miller. Feb 73, 205p Rept no. APL-MSO-F-195-Vol-1 FAA-RD-73-158-1
Contract DOT-FA72WA-2705
See also Volume 2, AD-775 306.

Descriptors: *Airport radar systems, *Radar clutter, Search radar, Air traffic control systems, Radar reflections, Reduction, Signal processing, Video signals, Pattern recognition.
Identifiers: Radar angels.

The goal of this study was to identify angel clutter reduction techniques which were cost-effective for the existing ASR-4, 5, and 6 radars. This report identifies a combination of techniques which can be implemented without major radar re-design and which improves the ASR surveillance capability. These techniques were developed by through analysis of ASR video and track radar data gathered during the Spring 1972 bird migrations at Milwaukee's General Mitchell Airport. The proposed angel clutter reduction (ACR) features operate on the three major differences observed between angel and aircraft signal characteristics: signal strength, pulse-to-pulse amplitude fluctuations, and velocity. These ACR features were chosen becausethey provide the highest level of effectiveness consistent with timely implementation and a reasonable degree of radar modification. (Modified author abstract)

AD-775 259/5GA PC$3.00/MF$1.45
Transportation Systems Center Cambridge Mass
INSTRUMENT LANDING SYSTEM (ILS) LOCALIZER PERFORMANCE STUDY FOR DALLAS/FORT WORTH AIRPORT, PART 2.
Rept. for Mar-Jun 73,
L. Jordan, D. Kahn, S. Morin, and R. Silva. Feb 74, 16p Rept no. TSC-FAA-73-33 FAA-RD-74-26
Contract FA-407
See also Part 1, AD-749 293.

Descriptors: *Instrument landings, Electromagnetic scattering, Hangers, Buildings, Degradation, Radio signals, Signals, Texas.
Identifiers: *Instrument landing systems, *Localizers.

The Transportation Systems Center electromagnetic scattering model was used to predict the course deviation indication (CDI) at the Dallas/Fort Worth Airport in the presence of several derogating structures in the report FAA-RD-72-96 'ILS Localizer Performance Study Part 1 Dallas/Fort Worth Regional Airport and Model Validation-Syracuse Hancock Airport.' In this report the recommendation was made to use a capture effect system localizer. In the present report several additional structures, the Braniff and Delta hangar buildings, are modeled. Using the recommended capture effect localizer, it is found that these two additional structures do not add significantly to the derogation, and the category 1 and category 2 operation is still possible on the four instrumented runways tested. (Author)

AD-775 290/0GA PC$5.75/MF$1.45
Massachusetts Inst of Tech Lexington Lincoln Lab
REPORT ON DABS/ATCRBS (DISCRETE ADDRESS BEACON SYSTEM/AIR TRAFFIC CONTROL RADAR BEACON SYSTEM) FIELD TESTING PROGRAM.
Project rept.,
J. R. Samson, and E. A. Crocker. 13 Feb 74, 52p Rept no. ATC-31 FAA-RD-74-5
Contracts F19628-73-C-0002, DOT-FA72WAI-261
Project report on Discrete Address Beacon System.

Descriptors: *Air traffic control systems, Radar beacons, Data links, Transmitting, Electromagnetic compatibility, Transponders.
Identifiers: Field tests, DABS(Discrete Address Beacon Systems), ATCRBS(Air Traffic Control Radar Beacon Systems), Air traffic control radar beacon systems, Discrete address beacon systems.

The purpose of the field test program was to verify laboratory measurements of the effect of discrete address beacon system uplink signal formats on air traffic control radar beacon system transponders. The DABS interrogations tested were: (1) a com-

bined ATCRBS Mode A/DABS All-Call consisting of a standard Mode A interrogation with an additional pulse following the P sub 3 pulse; (2) a DABS uplink message transmission consisting of a P sub 1-P sub 2 pulse pair followed by 25 microseconds of 4 megabit per second DPSK data modulation. The timing aspects of these waveforms were selected on the basis of a previous series of laboratory bench tests made in a small cross-section of the ATCRBS transponder population. The results of these field measurements performed on a larger cross-section of field operational ATCRBS transponders agree with the results of the bench testing program: The recommended DABS uplink transmissions result in an effective combined ATCRBS/DABS All-Call mode and minimum triggering of ATCRBS transponders by DABS message transmissions. (Author)

AD-775 306/4GA PC$6.50/MF$1.45
Johns Hopkins Univ Silver Spring Md Applied Physics Lab
ANGEL CLUTTER AND THE ASR AIR TRAFFIC CONTROL RADAR. VOLUME II. APPENDICES.
Final rept. Oct 71 Feb 73,
J. R. Barry, B. K. Carter, R. J. Erdahl, R. L. Harris, and J. T. Miller. Feb 73, 256p Rept no. APL-MSO-F-195-Vol-2 FAA-RD-73-158-2
Contract DOT-FA72WA-2705
See also Volume 1, AD-775 258.

Descriptors: *Airport radar systems, *Radar clutter, Search radar, Air traffic control systems, Radar reflections, Reduction, Signal processing, Pattern recognition, Video signals, Data acquisition.
Identifiers: Radar angels.

The goal of the study was to identify angel clutter reduction techniques which were cost-effective for the existing ASR-4, 5, and 6 radars. The report identifies a combination of techniques which can be implemented without major radar re-design and which improves the ASR surveillance capability. The Appendices provide a description of the field test instrumentation and supporting data and analyses. (Modified author abstract)

AD-775 313/0GA PC$3.00/MF$1.45
Massachusetts Inst of Tech Lexington Lincoln Lab
ATC SURVEILLANCE/COMMUNICATION ANALYSIS AND PLANNING.
Quarterly tech summary rept. 1 Sep-30 Nov 73.
1 Dec 73, 24p FAA-RD-73-207
Contract DOT-FA72WAI-242
See also AD-771 594.

Descriptors: *Air traffic control systems, Airport radar systems, Search radar, Digital systems, Processing equipment, Radar signals, Signal processing, Radar clutter, Landing aids, Monitors, Airborne.
Identifiers: PALM(Precision Altitude And Landing Monitors), Precision altitude and landing monitors.

Under Task B, ASR Improvement Program, excellent results were obtained in detecting aircraft embedded in heavy clutter using a coherent S-band radar (klystron-equipped FPS-18) coupled to a specially programmed, wide dynamic range, digital signal processor. Initial results were obtained over a small area of the radar's coverage. Construction of a full coverage Moving Target Detector (MTD) with similar properties is nearing completion. Progress under Task D, which provides support to NAFEC programs airborne beacon interference locator (ABIL), transponder performance analyzer (TPA), and E-Scan, is continuing. Software development of ABIL airborne processing is nearing completion. TPA applications are being defined and experimental data reviewed. Detailed recommendations for E-Scan test goals and procedures have been prepared for antenna pattern measurements. Considerable progress under Task E, Precision Altitude and Landing Monitor (PALM), was made during this quarter. The antenna system is being fabricated, and delivery is expected shortly. All other principal components have been received and perform within limits. (Modified author abstract)

AD-775 316/3GA PC$4.00/MF$1.45
Office of Telecommunications Boulder Colo Inst for Telecommunication Sciences
INVESTIGATION OF EFFECT OF ANTENNA SITE AND ANTENNA TYPE ON LF NON-DIRECTIONAL BEACON PERFORMANCE.
Final rept. fiscal year 1973,
Leslie A. Berry, R. G. FitzGerrell, and L. E. Vogler. Dec 73, 87p FAA-RD-73-174
Contract DOT-FA73-WAI-342

Descriptors: *Radio beacons, Low frequency, Omnidirectional antennas, Sites, Bearing(Direction), Errors, Terrain, Performance(Engineering).

The reasons that out-of-tolerance needle swings are indicated by low-frequency direction-finding receivers tuned to FAA non-directional beacon transmitters are investigated theoretically and experimentally. The main conclusions are: (1) The antenna type affects only the ease of tuning and the amount of effective radiated power, but not the directional characteristics. The cage monopole antenna appears to be the best of those studied. (2) The main cause of needle swings is large terrain features. All the terrain between the transmitter and receiver affects the needle swing, so only marginal improvement can be achieved by careful site selection or site modification. (3) If all other things are equal, the size and frequency of needle swings caused by terrain decrease with decreasing radio frequency. (Author)

AD-775 374/2GA PC$5.00/MF$1.45
Michigan Univ Ann Arbor Dept of Electrical and Computer Engineering
INVESTIGATION OF PARASITIC LOOP COUNTERPOISE ANTENNAS AND THEIR APPLICATION TO VOR SYSTEMS.
Final rept. Aug 69-Oct 72,
Dipak L. Sengupta, and Joseph E. Ferris. Dec 72, 158p Rept no. UMICH-3051-1-F FAA-RD-72-32
Contract FA-69-WA2085
Includes errata sheet.

Descriptors: *Loop antennas, *Radio ranges, Very high frequency, Parasites, Antenna radiation patterns, Polarization.
Identifiers: *VOR.

The radiation fields produced by conventional VOR and parastic loop counterpoise antennas were investigated both theoretically and experimentally. Theoretical expressions for the side band mode radiation fields produced by conventional VOR antennas were obtained by applying the concepts of geometrical theory of diffraction. Using similar techniques, expressions were obtained for both carrier and side band mode radiation fields produced by single parastic loop counterpoise antennas. It was found that for large separation distance between the parastic loops, the mutual coupling effects may be neglected during the evaluation of double parastic loop counterpoise antennas. (Modified author abstract)

COM-74-10536/2GA PC$3.25/MF$1.45
Exxon International Co., New York. Tanker Dept.
COLLISION AVOIDANCE SYSTEMS.
Final rept. Oct 70-Apr 73,
G. Sole. Sep 73, 35p* EII.10TMR.72 MA-RD-900-74041
Contract C-1-35049

Descriptors: *Collision avoidance, Ships, Shipboard computers, Radar, Digital systems, Display devices, Evaluation.

The report covers the shipboard evaluation of several Collision Avoidance Systems. It briefly explains the purpose of the systems, their main features and their relative value. In addition, a list of basic system requirements is provided. While no one system provides all desired features they have been found to provide substantial assistance in the Collision Avoidance function and are recommended for increased use by the Marine Industry. (Author)

N74-15104/4GA PC$3.00/MF$1.45
National Aerospace Lab., Tokyo (Japan).
ANALYSIS OF THE ANISOELASTIC ERRORS OF A FLOATED SINGLE DEGREE OF FREEDOM INTEGRATING GYRO.
M. Otsuki, H. Shingu, J. Tabata, T. Suzuki, and S. Enkyo. Jun 73, 12p NAL-TR-188T

Descriptors: *Anisotropy, *Elastic properties, *Gyroscopes, Degrees of freedom, Drift (Instrumentation), Error analysis.

For abstract, see STAR 1206

PAT-APPL-419 747 PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
POSITION DETERMINATION SYSTEMS.
Patent Application.
P. W. Shores. Filed 28 Nov 73, 17p NASA-CASE-MSC-12593-1,
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Antenna arrays, *Locates system, *Orbits, *Scanning, Airborne equipment, Celestial reference systems, *Patent applications, Position indicators.

Disclosed is a system for an orbital antenna which is operated at a synchronous altitude to scan an area of a celestial body. The orbiting antenna has scanning capabilities to determine the location of a ground based beacon or transmitter relative to a central surface location at a short time after activation of the beacon. The purpose of this system is to provide a means of determining the position of ground based beacons relative to a central location within seconds after activation of the beacon. Thus, rapid location of vehicles in distress such as ships at sea, auto wrecks, airplane crashes, or any other basic alarm function can be quickly located.

PATENT-3 782 205 Not available NTIS
National Aeronautics and Space Administration. Pasadena Office, Calif.
TEMPERATURE COMPENSATED DIGITAL INERTIAL SENSOR.
Patent.
P. J. Hand. Patented 1 Jan 74, 9p NASA-CASE-NPO-13044-1,
Misc-Filed 9 Nov. 1972 Supersedes N73-13436 (11 - 04, p 0421). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Accelerometers, *Attitude control, *Gyroscopes, *Inertial platforms, *Patents, Product development, Systems engineering, Temperature compensation.

A circuit which maintains the inertial element of a gyroscope or accelerometer at a constant position by delivering pulses to a rebalancing motor is discussed. The circuit compensates for temperature changes by using a temperature sensor that varies the threshold of inertial element movement required to generate a rebalance pulse which reacts to changes in viscosity of the flotation fluid. The output of the temperature sensor also varies the output level of the current source to compensate for changes in the strength of the magnets of the rebalancing motor. The sensor also provides a small signal to the rebalance motor to provide a temperature dependent compensation for fixed drift or fixed bias.

17H. Optical Detection

AD-775 283/5GA PC$5.75/MF$1.45
Naval Missile Center Point Mugu Calif
NAVAL MISSILE CENTER PHOTO DATA ANALYSIS OF STORE-SEPARATION FILMS.
Technical publication,
G. F. Cooper, and R. W. Kingery. 17 Jan 74, 54p
Rept no. NMC-TP-73-57

Descriptors: *Optical tracking, *Photographic recording systems, Photographic analysis, Triangulation, Guided missile tracking systems, Aircraft equipment, Flight simulation.
Identifiers: IBM 7094 computers, PDAS(Photo Date Analysis System), Photo data analysis system.

The Naval Missile Center has developed a novel method of store-separation analysis which uses the PDAS (photo data analysis system) and an IBM-7094 computer. It has greater speed and accuracy than the older conventional method. The PDAS involves superposition of two images, flight-test movie image of the separating store and an image of a scale model of the store, by video mixing. At superposition, the positional relationship of the store to its camera is proportional to that of the model and its camera. Lens distortion is bypassed because the flight-test camera lens is used on the model-viewing video camera. A six-degree-of-freedom, operator-controlled positioner orients the model in the field of view of its camera. High accuracy in position data extracted from the test is possible because many raster points are used in image superposition while the conventional system uses only a cross-hair intersection point. (Modified author abstract)

N74-15150/7GA PC$5.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
CORRECTION OF LASER RANGE TRACKING DATA FOR ATMOSPHERIC REFRACTION AT ELEVATIONS ABOVE 10 DEGREES.
J. W. Marini, and C. W. Murray, Jr.. Nov 73, 60p
NASA-TM-X-70555, X-591-73-351

Descriptors: *Atmospheric refraction, *Error correcting devices, *Laser range finders, *Range errors, Humidity, Pressure effects, Satellite tracking, Temperature effects.

For abstract, see STAR 1206

PATENT-3 781 111 Not available NTIS
National Aeronautics and Space Administration. Pasadena Office, Calif.
SHORT RANGE LASER OBSTACLE DETECTOR.
Patent.
W. L. Kuriger. Patented 25 Dec 73, 8p NASA-CASE-NPO-11856-1,
Misc-Filed 16 Mar. 1972 Supersedes N72-25490 (10 - 16, p 2164). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Barriers, *Detection, *Lasers, *Surface vehicles, Diodes, Mirrors, *Patents.

A short range obstacle detector for surface vehicles is described which utilizes an array of laser diodes. The diodes operate one at a time, with one diode for each adjacent azimuth sector. A vibrating mirror a short distance above the surface provides continuous scanning in elevation for all azimuth sectors. A diode laser is synchronized with the vibrating mirror to enable one diode laser to be fired, by pulses from a clock pulse source, a number of times during each elevation scan cycle. The time for a given pulse of light to be reflected from an obstacle and received is detected as a measure of range to the obstacle.

PATENT-3 781 549 Not available NTIS
National Aeronautics and Space Administration. Pasadena Office, Calif.
USE OF THIN FILM LIGHT DETECTOR.
Patent.
G. W. Lewicki, and J. Maserjian. Patented 25 Dec 73, 10p NASA-CASE-NPO-11432-2,
Misc-Filed 31 May 1972 Supersedes N72-28442 (10 - 19, p 2562). Subm-Continuation-in-Part of Abandoned US Patent Appl. Sn-88435, Filed 10 Nov. 1970 Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Photoelectric materials, *Photovoltaic cells, *Photovoltaic effect, Electric equipment, Equipment specifications, *Patents, Product development.

A photovoltaic cell device with a trapezoidal barrier is described. An aluminum, magnesium, or tantalum base is vapor deposited on a quartz substrate. An oxide or nitride film of the base metal is produced as an insulator by reaction in a glow discharge plasma to a thickness of less than 100 Angstroms. A metal, preferably gold, conter-electrode is vapor deposited on the insulating layer. A bias generator of high impedance is used to set and shift or modulate the spectral response of the device.

PB-228 715/9GA PC$5.75/MF$1.45
General Electric Co., Philadelphia, Pa. Space Div.
DEVELOPMENT OF RANGE SQUARED AND OFF-GATING MODIFICATIONS FOR A LIDAR SYSTEM.
Environmental Protection Technology series 27 Jun 72-5 Sep 73 (Final),
George W. Bethke. Sep 73, 54p EPA-650/2-73-040
Contract EPA-68-02-0570

Descriptors: *Optical radar, *Plume detection, Range gating, Revisions, Smoke, Air pollution, Remote sensing, Photomultiplier tubes, Data processing, Transmittance, Measurement.

The study was intended to eliminate the dominant source of error in the remote measurement of smoke-stack plumes using lidar, and to improve the data presentation of the lidar transmittance measurement. The use of a special grid-controlled photomultiplier tube and off-gating system has resulted in a large reduction of photomultiplier tube afterpulsing which has been the principal problem limiting the accuracy of plume transmittance measurements. A range-correcting time-squared amplifier has also been developed which permits much faster and more convenient data reduction than formerly possible. The above two developments have been adapted to an existing van-mounted EPA lidar system; and the improved overall system accuracy has been evaluated using both opaque and semi-transparent targets of known transmittance. (Author)

17I. Radar Detection

AD-774 829/6GA PC-GPO/MF$1.45-NTIS
National Oceanic and Atmospheric Administration Boulder Colo Wave Propagation Lab
FM/CW RADAR SIGNALS AND DIGITAL PROCESSING.
Technical rept.,
Donald E. Barrick. Jul 73, 28p Rept nos. NOAA-TR-ERL-283, WPL-26
Availability: Paper copy available from GPO $0.60 as C55.13:ERL 283-WPL-26.

Descriptors: *Radar signals, *Signal processing, Sounding, Continuous waves, Frequency modulation, Digital systems, Processing, Fourier transformation, Atmospheric sounding.

The use and processing of the FM/CW signal for radar and acoustic sounder systems are examined. This signal--along with real-time digital processing via minicomputers--is currently being used by several groups for HF over-the-horizon radars. A comparative analysis of the different processing techniques for general radar applications has yet to be undertaken. This note therefore attempts to promulgate details of these techniques so that they may find use in other systems. An example involving an HF backscatter radar is used to permit the reader to see how the technique are applied to an actual problem. (Modified author abstract)

AD-774 963/3GA PC$3.75/MF$1.45
Tennessee Univ Knoxville Dept of Electrical Engineering
STUDY OF AN ADAPTIVE METHOD FOR RADAR MULTIPATH ERROR REDUCTION.
Final rept. 1 Dec 72-30 Nov 73,
Robert C. Phares, and Peyton Z. Peebles, Jr. 31 Jan 74, 59p
Contract N00014-71-A-0121-0004

Descriptors: *Radar signals, *Signal processing, Microwave equipment, Adaptive systems, Multipath transmission, Radar clutter, Radar tracking, Errors, Processing equipment.

The purpose of this effort was to investigate possible realizations of a microwave signal processing method to eliminate multipath interference in angle tracking systems. The method treats the case of a direct return wave and a single multipath return wave from a target as a two target problem, and uses a two target signal processor to decouple the two signals and eliminate the multipath interference. Theoretical constraints and limitations on possible lossy and lossless processors were evaluated using scattering matrix formulation. General solutions for the processor element values were found, and these solutions were applied to specific operating situations. Using the scattering matrix relationships, it was found that in general, a lossy processor was possible, but a lossless processor was not. Based on these results, several hardware implementations for the processor were considered, and two complete designs were ultimately presented. (Modified author abstract)

AD-775 083/9GA PC$4.00/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
RADAR CROSS SECTION OF UNDERDENSE TURBULENT WAKES.
Physical sciences research papers,
Ronald L. Fante. 11 Oct 73, 16p Rept nos. AFCRL-73-0634, AFCRL-PSRP-568

Descriptors: *Reentry vehicles, *Plasma sheaths, *Radar cross sections, Electromagnetic scattering, Transport properties, Turbulent flow, Wake, Approximation(Mathematics), Target echoes.

Using transport theory, calculations were made for the radar cross section of an underdense turbulent wake in the limit when the scale size of the turbulence is larger than the signal wavelength. It was found that for bistatic scatter the first Born approximation is valid, even if the wake is many photon mean-free paths in extent. However, neither the Born approximation nor the modified Born approximation is valid for the nonstatic radar cross section when the wake is many photon mean-free paths in extent. In this case a modified result, derived in the report, must be used. (Modified author abstract)

AD-775 140/7GA PC$4.00/MF$1.45
Massachusetts Inst of Tech Lexington Lincoln Lab
MILLSTONE HILL RADAR PROPAGATION STUDY: INSTRUMENTATION.
Technical rept.,
Joseph C. Ghiloni. 20 Sep 73, 98p Rept no. TR-507 ESD-TR-73-247
Contract F19628-73-C-0002
Prepared in cooperation with Bell Telephone Labs., Inc., Whippany, N.J. Contract DAHC60-71-C-0005. Joint Radar Propagation Study.

Descriptors: *Radar, *Satellite tracking systems, Electromagnetic wave propagation, Instrumentation, Radar antennas, Ultrahigh frequency, Beacons, Tracking, L band, Guided missiles, Interfaces, Antimissile defense systems.
Identifiers: *Millstone Hill Radar.

The report describes the radar instrumentation used for satellite tracking. Particular emphasis is placed on the changes which were made to permit simultaneous monopulse tracking passively at UHF and actively at L-band and on other equipment modifications made in support of the Millstone Hill Propagation Study. (Author)

AD-775 442/7GA PC$4.50/MF$1.45
Alabama Univ Huntsville
ANALOG-TO-DIGITAL CONVERTER EVALUATION BY DIGITAL COMPUTER ANALYSIS OF RECORDED OUTPUT. VOLUME I.
Interim technical rept. 18 May 73-15 Feb 74,
Robert J. Polge, Louis Callas, Jr., B. K. Bhagavan, and Edward R. McKee, Jr. Feb 74, 125p Rept no. UAH-RR-149
Contract DAAH01-71-C-1181

Descriptors: *Analog to digital converters, *Signal processing, *Information theory, *Radar, Power spectra, Quantization, Fourier transformation, Sampling, Computer programs, FORTRAN, Digital simulation.
Identifiers: Fast Fourier transform, Experimental array radar.

Dynamic performance of an A/D converter cannot be assessed by conventional tests since they employ low frequency inputs. In this report, a digital computer procedure is developed to determine the presence and extent of errors due to time jitter, nonlinearity, gain, quantization and locked bits. The procedure is based on discrete power spectrum analysis of recorded outputs of the A/D converter using weighted or non-weighted sine wave input. A computer program is developed to compute the estimated power spectrum starting from discrete records of a signal and is used to show that a sine wave must be weighted to insure a narrow bandwidth. (Modified author abstract)

AD-775 533/3GA PC$3.25/MF$1.45
Chicago Univ Ill Lab for Atmospheric Probing
FLUCTUATION SPECTRUM AND VELOCITY STRUCTURE FUNCTION.
Technical rept.,
Jaroslav Sychra. 1 Jan 74, 28p Rept no. TR-33
AROD-9745.6-GS
Contract N00014-67-A-0285-0014, Grant DA-ARO-D-31-71-G71

Descriptors: *Radar signals, *Atmospheric disturbances, *Electromagnetic scattering, Functions(Mathematics), Variations, Meteorological radar.

An equation relating the fluctuation spectrum to the distribution of radial velocity differences of the scatterers, and the pulse volume illumination function is derived. Assuming that the radial velocity differences are due only to turbulence, the particles follow the air motions faithfully, the turbulence is homogeneous, and the reflectivity is constant, then it is shown that the variance of the fluctuation spectrum is a weighted average of the turbulence structure function, the weighting function being completely determined by the pulse volume illumination function. Various methods of estimating the structure function from measurements of the fluctuation spectrum variance are discussed. (Author)

N74-15699/3GA PC$6.25/MF$1.45
Royal Radar Establishment, Malvern (England). Ground Radar Div.
ON THE MINIMIZATION OF IDENTIFICATION RESIDUES.
W. B. Bishop, and P. L. Owen. Mar 73, 81p RRE-TN-773, BR36385

Descriptors: *Enemy personnel, *Identifying, *Recognition, *Warfare, Acceptability, Decision theory, Optimization, Probability theory, Rejection, Residues, Search radar.

For abstract, see STAR 1206

PATENT-3 742 501 Not available NTIS
Department of the Air Force Washington D C
RADAR APPARATUS WITH DIRECTIONAL DISCRIMINATION AND INCREASED RADAR SENSITIVITY.
Patent,
Harry Urkowitz, and Samuel M. Sherman. Filed 21 Mar 72, patented 26 Jun 73, 4p Rept nos. PAT-APPL-236 630,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Monostatic radar, *Patents, Target acquisition, Discrimination, Directional, Sensitivity, Radar equipment, Doppler effect.
Identifiers: PAT-CL-343-7-7.

The patent describes a radar apparatus with directional discrimination and improved detection. A monostatic radar system has its transmitter and receiving antenna at the same location. Target motion toward or away from the radar is discovered by determining the direction of the doppler frequency shift imposed upon the reflected electromagnetic energy after impinging on a target. Directional capability is obtained by determining whether the doppler frequency shift is positive or negative and simultaneously there is also provided increased radar signal sensitivity.

PATENT-3 745 567 Not available NTIS
Department of the Air Force Washington D C
WIDEBAND RADAR RECEIVER PROTECTIVE APPARATUS.
Patent,
William C. Quinn, Albert F. Morreall, and Alexander V. Ross. Filed 9 Mar 72, patented 10 Jul 73, 6p Rept nos. PAT-APPL-233 066,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Radar receivers, *Attenuators, *Patents, Broadband, Glow discharges, Plasma medium.
Identifiers: PAT-CL-343-5.

The patent describes a wideband radar receiver protective apparatus. A glass envelope in the shape of an elongated doughnut is used to provide a low pressure glow discharge in a coaxial configuration. The coaxial configuration consists of two separated sections of coaxial transmission line with the glass envelope interposed therebetween. The coaxial configuration interconnects a transmitter and the receiver to be protected. Generation of the glow plasma is controlled by means of a power source separate from the transmitter. The length of the glow region determines the amount of attentuation. The glass envelope includes an inert gas in combination with a barium getter to preserve the purity of the gas almost indefinitely.

PATENT-3 745 568 Not available NTIS
Department of the Air Force Washington D C
SPECTRUM ANALYSIS RADAR.
Patent,
John K. Schindler, and F. Sheppard Holt. Filed 11 Apr 72, patented 10 Jul 73, 4p Rept nos. PAT-APPL-242 996,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Continuous wave radar, *Patents, Spectrum analysis, Signal processing, Phase shift circuits, Noise reduction.
Identifiers: PAT-CL-343-5-SA.

The patent describes a signal processing technique for the spectrum analysis radar which permits simultaneous measurement of target range and radial velocity.

17J. Seismic Detection

AD-774 984/9GA PC$3.00/MF$1.45
Teledyne Geotech Alexandria Va Seismic Data Analysis Center
QUARTERLY TECHNICAL SUMMARY REPORT, OCTOBER-DECEMBER 1973.
Technical rept.,
Royal A. Hartenberger. 15 Jan 74, 12p
Contract F08606-74-C-0006, ARPA Order-1620
See also report dated 15 Oct 73, AD-770 901.

Descriptors: *Seismological stations, *Seismic detection, *Data processing, Nuclear explosions, Earthquakes, Underground explosions, Maintenance, Seismometers, Signal processing, Networks, Norway, Montana, Alaska.
Identifiers: Vela Uniform, Large aperture seimic array, Alaskan long period array, Norwegian seismic array, IBM 360/44 computers, PDP-15 computers.

The report summarizes the operations and maintenance tasks and the research work accomplished at the SDAC during the quarter ending 31 December 1973. (Author)

18. NUCLEAR SCIENCES AND TECHNOLOGY

18A. Fusion Devices (Thermonuclear)

BNL-18236 PC$8.50/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
STUDIES OF FUSION REACTOR BLANKETS WITH MINIMUM RADIOACTIVE INVENTORY AND WITH TRITIUM BREEDING IN SOLID LITHIUM COMPOUNDS: A PRELIMINARY REPORT.
J. R. Powell, F. T. Miles, A. Aronson, and W. E. Winsche. Jun 73, 130p

Descriptors: (*Thermonuclear reactors, Breeding blankets), (*Breeding blankets, Aluminium), (*Niobium, Breeding blankets), (*Aluminium, Breeding blankets), Breeding, Coolants, Efficiency, Helium, Lithium, Radioisotopes, Sap, Stainless steels, Thermodynamic cycles, Tritium.

For abstract, see NSA 29 05, number 11652.

IAE-2246 PC$3.00/MF$1.45
Gosudarstvennyj Komitet Po Ispol'Zovaniyu Atomnoj Ehnergii Sssr, Moscow. Inst. Atomnoj Ehnergii.
PRELIMINARY CALCULATION OF THE PARAMETERS OF AN EXPERIMENTAL THERMONUCLEAR REACTOR BASED ON A TOKAMAK (ETRT).
G. N. Popkov, and V. S. Strelkov. 1972, 13p
In Russian. U.S. Sales Only.

Descriptors: (*Thermonuclear reactors, *Specifications), (*Tokamak devices, Specifications), Cyclotron radiation, Deuterium, Energy balance, Energy losses, Joule heating, Plasma filament, Plasma heating, Thermal insulation, Tritium.

For abstract, see NSA 29 05, number 11653.

IPP-1-134 PC$4.00/MF$1.45
Max-Planck-Institut fuer Plasmaphysik, Garching/Munich (F.R. Germany).
CONSTRUCTION, OPERATION, AND PROPERTIES OF TEA-CO SUB 2 LASERS.
G. Decker, L. Kellerer, and H. Roehr. Jul 73, 37p
In German. U.S. Sales Only.

Descriptors: (*Lasers, *Specifications), Carbon dioxide, Energy spectra, Operation, Pressure dependence.

For abstract, see NSA 29 05, number 12456.

IPP-2-215 PC$3.50/MF$1.45
Max-Planck-Institut fuer Plasmaphysik, Garching/Munich (F.R. Germany).
STELLARATOR FIELDS WITH TWISTED COILS.
S. Rehker, and H. Wobig. Aug 73, 26p
U.S. Sales Only.

Descriptors: (*Stellarators, *Magnetic fields), Magnet coils, Rotational transform.

For abstract, see NSA 29 05, number 11654.

IPP-4-101 PC$4.50/MF$1.45
Max-Planck-Institut fuer Plasmaphysik, Garching/Munich (F.R. Germany).
NEUTRON FLUX ASYMMETRY IN TOROIDAL GEOMETRIES.
W. Daenner. Sep 72, 46p
U.S. Sales Only.

Descriptors: (*Tokamak devices, *Neutron flux), (*Stellarators, Neutron flux), Distribution, Plasma, Thermonuclear reactor walls, Toroidal configuration.

For abstract, see NSA 29 05, number 11655.

LA-UR-73-1612 PC$3.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
PREDICTION OF FAILURES IN C.T.R. SYSTEMS.
G. P. Boicourt. 1973, 6p CONF-731114-26

Descriptors: (*Thermonuclear reactors, *Engineering), Failures, Monte carlo method, Thermonuclear reactor walls, Theta pinch.

For abstract, see NSA 29 05, number 11656.

LA-UR-73-1613 PC$3.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
TRITIUM ION BEAM FOR AN INTENSE NEUTRON SOURCE, INS.
E. R. Emigh. 1963, 6p
Contract W-7405-eng-36

Descriptors: (*Neutron sources, *Ion beams), (*Tritium ions, Ion beams), Beam optics, Beam transport, Colliding beams, Deuterium, Duoplasmatrons, Focusing, Mev range 10-100, Molecular beams, Thermonuclear reactions.

For abstract, see NSA 29 05, number 11657.

LBL-2425 PC$3.00/MF$1.45
California Univ., Berkeley (Usa). Lawrence Berkeley Lab.
NEUTRAL-BEAM RESEARCH AND DEVELOPMENT AT LBL, BERKELEY.
W. R. Baker, K. H. Berkner, W. S. Cooper, K. W. Ehlers, and W. B. Kunkel. Nov 73, 11p CONF-731114-23
Contract W-7405-eng-48

Descriptors: (*Atomic beams, *Specifications), (*Molecular beams, Specifications), Beam currents, Deuterium, Electric potential, Ion sources, Magnetic mirror configurations, Research programs.

For abstract, see NSA 29 05, number 11658.

ORNL-TM-4201 PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
ADDITIONAL RESULTS CONCERNING CROSS-SECTION SENSITIVITY OF TRITIUM BREEDING IN A FUSION REACTOR BLANKET: EXP 6 LI, EXP 7 LI, AND EXP 93 NB.
M. Tobias, and D. Steiner. Jan 74, 20p
Contract W-7405-eng-26

Descriptors: (*Thermonuclear reactors, *Breeding), (*Tritium, Breeding), Breeding blankets, Cross sections, Lithium 6, Lithium 7, Neutron reactions, Niobium 93.

For abstract, see NSA 29 05, number 11660.

18B. Isotopes

CEA-CONF-2181 PC$3.00/MF$1.45
ANALYTICAL APPLICATIONS OF SEALED RADIOACTIVE SOURCES IN THE TEXTILE INDUSTRY.
P. Martinelli. 10 Nov 72, 20p CONF-721142-1
In French. U.S. Sales Only.

Descriptors: (*Textiles, *Isotope applications), (*Sealed sources, Textiles), Alpha sources, Beta sources, Chlorine, Gamma sources, Humidity, Neutron sources, Radiometric analysis, X-ray fluorescence analysis.

For abstract, see NSA 29 05, number 10334.

COM-74-50079/4GA Not available NTIS
National Bureau of Standards, Washington, D.C.
THE EVALUATION OF RADIOCARBON MEASUREMENTS AND INHERENT STATISTICAL LIMITATIONS IN AGE RESOLUTION.
Final rept.,
Lloyd A. Currie. 1973, 14p
Pub. in Proceedings of International Conference on Radiocarbon Dating (8th), Wellington, New Zealand, 18-25 Oct 72.

Descriptors: *Radiocarbon dating, Statistical analysis, Evaluation.

A uniform approach, based upon the statistical behavior of random measurement errors, is suggested for assessing the relative merit of alternative methods of measuring radiocarbon and for interpreting and reporting the results of such measurements. The need for an objective, uniform approach is manifest because of the increasing concern with results which are close to the limits of precision or detection of the dating procedures.

DP-1333 PC$4.00/MF$1.45
Du Pont de Nemours (E.I.) and CO., Aiken, S.C. (Usa). Savannah River Lab.
PROCESSING OF EXP 238 PU AND EXP 237 NP WITH MACROPOROUS ANION EXCHANGE RESIN.
G. H. Thompson, and G. A. Burney. Nov 73, 19p
Contract AT(07-2)-1

Descriptors: (*Plutonium 238, *Ion exchange), (*Neptunium 237, Ion exchange), Isotope production, Organic ion exchangers, Purification, Resins, Separation processes, Stability.

For abstract, see NSA 29 05, number 09987.

NP-19864 PC$4.00/MF$1.45
Stichting Reactor Centrum Nederland, the Hague.
URANIUM ENRICHMENT IN THE NETHERLANDS.
F. E. T. Kelling, A. H. Lindhout, B. H. van de Wijngaert, and M. van der Stoel. 1973, 40p
In Dutch. U.S. Sales Only.

Descriptors: (*Uranium isotopes, *Isotope separation), Leading abstract, Netherlands.

For abstract, see NSA 29 05, number 10306.

NP-19902 PC$3.75/MF$1.45
Forskningsraadens Lab., Studsvik (Sweden).
USE OF THERMOCHROMATOGRAPHY FOR RAPID CHEMICAL SEPARATION. PART I. APPLICATION TO STEADY STATE SEPARATION OF FISSION PRODUCT ISOBARS OBTAINED WITH AN ISOTOPE SEPARATOR ON-LINE A REACTOR.
B. Grapengiesser, and G. Rudstam. 1973, 32p LF-43
U.S. Sales Only.

Descriptors: (*Radioisotopes, *Isotope production), (*Fission products, *Separation processes), Chemical preparation, Chromatography, Isobaric nuclei, On-line systems, Purification.

For abstract, see NSA 29 05, number 09988.

NP-19903 PC$4.00/MF$1.45
Forskningsraadens Lab., Studsvik (Sweden).
USE OF THERMOCHROMATOGRAPHY FOR RAPID CHEMICAL SEPARATION. PART II. DETERMINATION OF DEPOSITION TEMPERATURES.
G. Rudstam, and B. Grapengiesser. 1973, 40p LF-44
U.S. Sales Only.

Descriptors: (*Fission products, *Chromatography), (*Sodium, Chromatography), (*Cobalt, Chromatography), (*Zinc, Chromatography), Antimony, Arsenic, Barium, Bromine, Cadmium, Cesium, Chemical preparation, Deposition, Germanium, Indium, Iodine, Isobaric nuclei, Isotope production, On-line systems, Quartz, Rubidium, Separation processes, Silver, Tellurium, Temperature dependence, Tin.

For abstract, see NSA 29 05, number 09989.

18C. Nuclear Explosions

AD-774 773/6GA PC$3.25/MF$1.45
Mission Research Corp Santa Barbara Calif
DEVELOPMENT OF THE GLANC EMP CODE.
Topical rept.,
H. Jerry Longley, and Conrad L. Longmire. 10 Dec 73, 50p DNA-3221T
Contract DASA01-69-C-0058
Also prepared by Los Alamos Nuclear Corp., Calif., as Rept. no. LANC-R-7.

Descriptors: *Nuclear explosions, *Electromagnetic pulses, Computer programming, Maxwells equations, Computations.
Identifiers: GLANC computer code.

GLANC is a computer code for obtaining the solution, by finite difference methods, of Maxwell's equations in one space dimension and retarded time, for the electromagnetic fields near the ground-air interface which are produced by a nuclear burst near or on the ground. It is a versatile code with the major new innovation being the treatment of the source in a self-consistent manner by the injection of sample Compton electrons.

FOA-4-4558-A-1 PC$3.00/MF$1.45
Foersvarets Forskningsanstalt, Stockholm (Sweden). Hagfors Observatorium.
TWO USSR EXPLOSIONS IN EASTERN KAZAKH, DECEMBER 10, 1972. EVENT REPORT NO. 10.
Oct 73, 14p
U.S. Sales Only.

Descriptors: (*Nuclear explosion detection, *Seismic waves), Underground explosions, Ussr.

For abstract, see NSA 29 05, number 10097.

LA-5425-MS PC$4.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
IN SITU PERMEABILITY MEASUREMENTS FOR THE EVENT IN U1-C.
C. Keller, D. Engstrom, and F. West. Nov 73, 16p
Contract W-7405-eng-36

Descriptors: (*Nevada test site, Soils), (*Soils, *Permeability), Cavities, Data, Drill cores, Gas flow.

For abstract, see NSA 29 05, number 10103.

LA-5449-MS PC$4.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
SIMULATION OF TURBULENCE IN FIREBALLS.
H. M. Ruppel, R. A. Gentry, and B. J. Daly. Nov 73, 9p
Contract W-7405-eng-36

Descriptors: (*Nuclear explosions, Fireball model), (*Fireball model, *Turbulence), Atmospheric explosions, Y codes.

For abstract, see NSA 29 05, number 10104.

UCRL-51391 PC$5.45/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
PONDER: A FORTRAN CODE THAT GRAPHICALLY REPRESENTS NUCLEAR BLACKOUT EFFECTS.
M. D. Maples. 1 Aug 73, 130p
Contract W-7405-eng-48

Descriptors: (*Computer codes, *P codes), (*Radar, Nuclear explosions), (*Nuclear explosions, *Ionization), Atmospheric explosions, Fortran, Missiles, Reentry, Trajectories.

For abstract, see NSA 29 05, number 10107.

UCRL-51426 PC$5.45/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
PALLOT: A FORTRAN CODE THAT PRODUCES GRAPHICAL REPRESENTATIONS OF NUCLEAR BLACKOUT EFFECTS ALONG A REENTRY TRAJECTORY.
M. D. Maples. 17 Aug 73, 123p
Contract W-7405-eng-48

Descriptors: (*Computer codes, *P codes), (*Radar, Nuclear explosions), (*Reentry, *Trajectories), (*Nuclear explosions, *Ionization), Atmospheric explosions, Cdc computers, Fortran, Missiles.

For abstract, see NSA 29 05, number 10108.

18D. Nuclear Instrumentation

AAEC/E-283 PC$4.25/MF$1.45
Australian Atomic Energy Commission Research Establishment, Lucas Heights.
EXPOSURE CALIBRATION OF A THIMBLE CHAMBER BY CALORIMETRIC AND IONIMETRIC METHODS.
D. F. Urquhart, E. P. Johnson, and W. S. Badger. Aug 73, 44p
U.S. Sales Only.

Descriptors: (*Ionization chambers, *Calibration), (*Gamma dosimetry, Ionization chambers), Accuracy, Aluminium, Attenuation, Calorimeters, Cesium 137, Cobalt 60, Comparative evaluations, Corrections, Electric currents, Graphite, Radiation doses, Radiation quality.

For abstract, see NSA 29 05, number 10215.

AD-775 031/8GA Not available NTIS
National Research Council of Canada Ottawa (Ontario) Div of Physics
THE EFFICIENCY EXTRAPOLATION METHOD IN COINCIDENCE COUNTING,
A. P. Baerg. 1973, 8p
Availability: Pub. in the Nuclear Instruments and Methods, v112 p143-150 1973.

Descriptors: *Coincidence counting, Extrapolation, Gamma rays, Beta decay, Canada.

A variety of nuclear species can now be measured by 4 pi (beta)(gamma)-coincidence methods making use of extrapolation procedures, but without requiring detailed knowledge of decay scheme parameters. By varying the beta-detector efficiency an experimental function is obtained giving the beta-channel counting rate in terms of the coincidence-to-gamma-channel counting ratio, (N sub c)/(N sub gamma). This function is taken to give the source disintegration rate when (N sub c)/(N sub gamma) has unit value. The techniques used in practice are reviewed and the theory examined in some detail to show how valid measures can be achieved experimentally. Since least squares data fitting plays an important role in the extrapolation procedure, methods are outlined which currently appear to be essentially free of major ambiguities. (Author)

AD-775 032/6GA Not available NTIS
National Research Council of Canada Ottawa (Ontario) Div of Physics
PRESSURIZED PROPORTIONAL COUNTERS FOR COINCIDENCE MEASUREMENTS,
A. P. Baerg. 1973, 5p
Availability: Pub. in the Nuclear Instruments and Methods, v112 p95-99 1973.

Descriptors: *Proportional counters, *Coincidence counting, Beta particles, Gamma rays, Canada.

The experimental requirements for absolute measurements by 4 pi (beta)(gamma)-coincidence counting with efficiency variation are outlined. In this context the use and operating characteristics of a pressurized 4 pi (beta)-proportional counter are considered. Basically, when the counter is pressurized, energetic (beta)-particles deposit a larger fraction of their energies in the sensitive volume. The added property of proportionality then permits efficiency variation by low energy discrimination. This is especially advantageous for measurements on complex beta-gamma decay, electron capture and mixed radiations. (Author)

AERE-R-6935 PC$3.00/MF$1.45
Ukaea Research Group, Harwell. Atomic Energy Research Establishment.
THERMAL DIFFUSION OF LITHIUM INTO HIGH PURITY SINGLE CRYSTAL SILICON.
G. Knill. Oct 73, 12p
U.S. Sales Only.

Descriptors: (*Li-drifted si detectors, *Fabrication), Lithium additions, Silicon, Thermal diffusion.

For abstract, see NSA 29 05, number 10171.

CEA-CONF-2322 PC$3.25/MF$1.45
NEW MECHANICAL SPECTROMETER USING THERMAL NEUTRONS.
C. Bugnone, and J. Comera. Oct 71, 22p CONF-720228-1
In French. U.S. Sales Only.

Descriptors: (*Neutron spectrometers, Neutron choppers), (*Neutron choppers, *Design), Corrections, Thermal neutrons.

For abstract, see NSA 29 05, number 10240.

CERN-73-14 PC$4.00/MF$1.45
European Organization for Nuclear Research, Geneva (Switzerland).
STUDY OF SYSTEMATIC AND RANDOM ERRORS OF THE CERN 2 METRE HYDROGEN BUBBLE CHAMBER.
G. Ekspong, L. Voyvodic, and J. Zoll. 7 Nov 73, 39p
U.S. Sales Only.

Descriptors: (*Bubble chambers, *Errors), Cern ii synchrotron, Deuterium, Hydrogen.

For abstract, see NSA 29 05, number 10260.

CISE-N-163 PC$4.00/MF$1.45
Centro Informazioni Studi Esperienze, Milan (Italy).
STUDY AND CONSTRUCTION OF GE(LI) DETECTORS. PART 1.
A. Capelli, M. Masini, and G. Redaelli. Sep 73, 36p
U.S. Sales Only.

Descriptors: (*Li-drifted ge detectors, *Fabrication), (*Gamma detection, Li-drifted ge detectors), Gamma spectrometers, Operation.

For abstract, see NSA 29 05, number 10172.

COO-1671-47 PC$3.50/MF$1.45
Nebraska Univ., Lincoln (Usa).
PARTICLE DETECTION AND CELLULAR INACTIVATION: A UNIFIED THEORY OF TRACK STRUCTURE.
R. Katz. 1973, 27p CONF-730345-1

Descriptors: (*Radiation detectors, *Performance), (*Heavy ions, *Particle tracks), Compton effect, Gamma radiation, Mathematical models, Radiation detection.

For abstract, see NSA 29 05, number 11682.

COO-3258-1 PC$6.75/MF$1.45
Clarkson Coll. Of Tech., Potsdam, N.Y. (Usa).
ENERGETIC NEUTRON SPECTROMETRY. FINAL REPORT, DECEMBER 1, 1967--MARCH 31, 1972.
R. Madey, and F. M. Waterman. Nov 73, 95p
Contract AT(30-1)-3914

Descriptors: (*Neutron spectrometers, *Performance), (*Depleted uranium, *Neutron transport), (*Fast neutrons, *Neutron spectra), Efficiency, Energy resolution, Mev range, Plastic scintillation detectors, Proton reactions, Time-of-flight spectrometers, Timing properties.

For abstract, see NSA 29 05, number 10241.

DESY-73-41 PC$3.50/MF$1.45
Deutsches Elektronen-Synchrotron (Desy), Hamburg (F.R. Germany).
BUBBLE GROWTH AND BUBBLE DENSITIES IN BUBBLE CHAMBERS FILLED WITH NEON/HYDROGEN MIXTURES.
G. Horlitz, S. Wolff, and G. Harigel. Sep 73, 30p
U.S. Sales Only.

Descriptors: (*Bubble chambers, *Bubble growth), Hydrogen, Mixtures, Neon, Pressure dependence, Temperature dependence.

For abstract, see NSA 29 05, number 10261.

FEI-362 PC$4.00/MF$1.45
Gosudarstvennyj Komitet Po Ispol'Zovaniyu Atomnoj Ehnergii Sssr, Obninsk. Fiziko-Ehnergeticheskij Inst.
SPECIAL METHODS OF PROCESSING AND REGISTRATION OF APPARATUS DISTRIBUTIONS OF NEUTRONS AND GAMMA-QUANTA.
O. A. Trykov, and V. V. Vladimirov. 1972, 36p
In Russian. U.S. Sales Only.

Descriptors: (*Neutron spectrometers, *Particle discrimination), Background radiation, Gamma radiation, Proportional counters, Proton recoil detectors, Scintillation counters.

For abstract, see NSA 29 05, number 10242.

INP-836 PC$4.75/MF$1.45
Institute of Nuclear Physics, Krakow (Poland).
AUTOMATIC UNIT FOR KD SOG-1 NEUTRON SPECTROMETER CONTROL.
A. Bajorek, J. Brankowski, W. Olejarczyk, A. Ostrowicz, and J. Sokolowski. May 73, 54p
In Polish. U.S. Sales Only.

Descriptors: (*Neutron spectrometers, *Control systems), Ibr-30 reactor.

For abstract, see NSA 29 05, number 10243.

JINR-P10-7284 PC$4.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of High Energy.
GEOMETRIC RECONSTRUCTION PROGRAM FOR EVENTS IN THE FILMLESS SPARK SPECTROMETER.
D. Vestergombi, A. S. Vovenko, F. Deak, V. V. Kukhtin, and I. A. Savin. 1973, 39p
In Russian. U.S. Sales Only.

Descriptors: (*Spark chambers, *Data processing), Decay, Kaons neutral.

For abstract, see NSA 29 05, number 10266.

JINR-P10-7460 PC$3.50/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Computing Techniques and Automation.
PROGRAMME FOR DATA STORAGE AND APPARATUS CHECK-UP IN EXPERIMENTS WITH HIGH ENERGY K EXP 0 -MESONS.
A. S. Vovenko, N. N. Govorun, and I. A. Golutvin. 1973, 28p
In Russian. U.S. Sales Only.

Descriptors: (*Spark chambers, *Data acquisition), (*Computer codes, *K codes), Besm computers, Decay, Kaons neutral.

For abstract, see NSA 29 05, number 10267.

JINR-P13-7492 PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of High Energy.
FAST DIGITAL CODER CONNECTED WITH THE CAMAC DATAWAY FOR HODOSCOPE SYSTEMS.
S. G. Basiladze, and Z. Guzik. 1973, 12p
In Russian. U.S. Sales Only.

Descriptors: (*Hodoscopes, *Data acquisition systems), (*Multiwire proportional chambers, Data acquisition systems), Camac system, Digital circuits.

For abstract, see NSA 29 05, number 10268.

JINR-P3-7379 PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Neutron Physics.
SYSTEM FOR CREATION OF OSCILLATING MAGNETIC FIELD IN MAGNETIC RESONANCE SPECTROMETER ON UCN.
Yu. V. Nikitenko, and Yu. V. Taran. 1973, 16p
In Russian. U.S. Sales Only.

Descriptors: Cold neutrons, Magnetic fields, Magnetic resonance, Neutron spectrometers.

For abstract, see NSA 29 05, number 10246.

LA-UR-73-1564 PC$3.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
PORTAL MONITOR FOR DIVERSION SAFEGUARDS.
T. E. Sampson, P. E. Fehlau, G. M. Worth, and C. N. Henry. 1973, 20p CONF-731101-45
Contract W-7405-eng-36

Descriptors: (*Safeguards, Radiation monitors), (*Radiation monitors, *Performance), Efficiency, Nuclear materials diversion, Personnel, Plastic scintillation detectors, Plutonium 239, Sodium iodides, Solid scintillation detectors, Uranium 235, Uranium 238.

For abstract, see NSA 29 05, number 10769.

LA-5455-MS PC$4.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
USE OF MULTIPLE 4 PI RADIATION SOURCES FOR QUASI-UNIFORM IRRADIATION OF SQUARE SURFACES.
R. W. Clark, and D. A. Freiwald. Nov 73, 7p
Contract W-7405-eng-36

Descriptors: (*Radiation sources, *Optimization), (*Irradiation devices, *Geometry), Computer calculations, Irradiation, Surfaces, Targets.

For abstract, see NSA 29 05, number 11713.

LBL-2419 PC$3.00/MF$1.45
California Univ., Berkeley (Usa). Lawrence Berkeley Lab.
MULTIWIRE PROPORTIONAL CHAMBER FOR IMAGING THERMAL, EPICADMIUM, AND FAST NEUTRONS.
K. Velentine, S. Kaplan, V. Perez-Mendez, and L. Kaufman. Nov 73, 6p CONF-731112-21
Contract W-7405-eng-48

Descriptors: (*Multiwire proportional chambers, *Performance), (*Neutron radiography, Multiwire proportional chambers), Boron, Efficiency, Epithermal neutrons, Fast neutrons, Polyethylenes, Spatial resolution, Thermal neutrons.

For abstract, see NSA 29 05, number 10175.

LBL-2420 PC$3.00/MF$1.45
California Univ., Berkeley (Usa). Lawrence Berkeley Lab.
RECENT DEVELOPMENTS IN DELAY LINE READOUT OF MULTIWIRE PROPORTIONAL CHAMBERS.
V. Perez-Mendez, and S. I. Parker. Nov 73, 10p CONF-731112-19
Contract W-7405-Eng-48

Descriptors: (*Multiwire proportional chambers, *Readout systems), Delay circuits, Specifications.

For abstract, see NSA 29 05, number 10269.

LBL-2423 PC$3.00/MF$1.45
California Univ., Berkeley (Usa). Lawrence Berkeley Lab.
MEASURING SYSTEM FOR STUDYING THE TIME-RESOLUTION CAPABILITIES OF FAST PHOTOMULTIPLIERS.
C. C. Lo, and B. Leskovar. Nov 73, 18p CONF-731112-18
Contract W-7405-eng-48

Descriptors: (*Photomultipliers, *Time resolution), Electronic circuits, Light sources, Performance testing, Pulse discriminators, Pulse generators.

For abstract, see NSA 29 05, number 12470.

LNF-73-8 PC$5.00/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Frascati (Italy). Laboratori Nazionali di Frascati.
OPTICS OF THE MAGNETIC SPECTROMETER IN THE FIRST AND SECOND ORDER APPROXIMATIONS. PART II. MULTIPOLE SERIES DEVELOPMENT OF THE COMPONENTS OF THE FIELD AT THE INTERIOR OF THE CENTRAL TRAJECTORY.
G. Sanna. 1 Mar 73, 57p
In Italian. U.S. Sales Only.

Descriptors: (*Magnetic spectrometers, *Magnetic fields), Beam optics, Multipoles.

For abstract, see NSA 29 05, number 10247.

LURI-1973-5 PC$3.00/MF$1.45
Lund Univ. (Sweden). Radiofysiska Institutionen.
WHOLE-BODY COUNTER: CALIBRATION EXP 137 CS AND POTASSIUM IN CHAIR GEOMETRY.
S. Carlsson, and K. Liden. Aug 73, 5p
In Swedish. U.S. Sales Only.

Descriptors: (*Whole-body counters, *Calibration), Accuracy, Accuracy, Cesium 132, Cesium 137, Gamma radiation, Phantoms, Potassium, Solid scintillation detectors.

For abstract, see NSA 29 05, number 10176.

NP-19893 PC$3.50/MF$1.45
Science Research Council, London (Uk).
NEUTRON BEAM FACILITIES AVAILABLE FOR UNIVERSITY USERS AT ATOMIC ENERGY RESEARCH ESTABLISHMENT, HARWELL, AND ATOMIC WEAPONS RESEARCH ESTABLISHMENT, ALDERMASTON.
Jun 73, 30p
U.S. Sales Only.

Descriptors: (*Neutron diffractometers, *Reactor experimental facilities), (*Neutron spectrometers, Reactor experimental facilities), Aere, Neutron beams, Radiation sources, Research programs.

For abstract, see NSA 29 05, number 10248.

N74-15110/1GA PC$3.50/MF$1.45
Rome Univ. (Italy). Inst. of Physics.
TRACKS DISCRIMINATION OF LOW ENERGY NUCLEI IN PLASTICS.
G. Baroni, S. Diliberto, S. Petrera, G. Romano, and C. Sgarbi. 17 Apr 73, 29p NOTA-INTERNA-458

Descriptors: *Cellulose nitrate, *Nuclei (Nuclear physics), *Particle trajectories, *Plastics, Discrimination, Particle energy, Radiation detectors.

For abstract, see STAR 1206

PATENT-3 781 562 Not available NTIS
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
MOSSBAUER SPECTROMETER RADIATION DETECTOR.
Patent.
J. J. Singh. Patented 25 Dec 73, 4p NASA-CASE-LAR-11155-1,
Misc-Filed 8 Dec. 1972 Supersedes N73-13433 (11 - 04, p 0421).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Backscattering, *Mossbauer effect, *Radiation detectors, *Spectrometers, *Patents, Photomultiplier tubes, Single crystals, Sodium iodides.

A Mossbauer spectrometer with high efficiencies in both transmission and backscattering techniques is described. The device contains a sodium iodide crystal for detecting radiation caused by the Mossbauer effect, and two photomultipliers to collect the radiation detected by the crystal. When used in the transmission technique, the sample or scatterer is placed between the incident radiation source and the detector. When used in a backscattering technique, the detector is placed between the incident radiation source and the sample of scatterer such that the incident radiation will pass through a hole in the crystal and strike the sample. Diagrams of the instrument are provided.

PTB-FMRB-48 PC$6.25/MF$1.45
Physikalisch-Technische Bundesanstalt, Brunswick (F.R. Germany). Forschungs- und Messreaktor.
USE OF EXOELECTRONS IN THE DOSIMETRY OF GAMMA AND X RADIATION.
H. J. Kriks. Jul 73, 81p
In German. U.S. Sales Only.

Descriptors: (*Gamma dosimetry, Exoelectron dosemeters), (*X-ray dosimetry, Exoelectron

dosemeters), (*Exoelectron dosemeters, *Performance), Beryllium oxides, Dosimetry, Exoelectrons, Gamma radiation, X radiation.

For abstract, see NSA 29 05, number 10222.

RD/B/N-2645 PC$3.00/MF$1.45
Central Electricity Generating Board, Berkeley (Uk). Berkeley Nuclear Labs.
INTERPRETATION OF SOME UNUSUAL FILM BADGE PATTERNS IN THE MEASUREMENT OF SURFACE DOSE.
M. J. Hill, and G. J. Brindle. Jul 73, 19p
U.S. Sales Only.

Descriptors: (*Photographic film dosemeters, *Readout systems), (*Gamma dosimetry, Photographic film dosemeters), (*Beta dosimetry, Photographic film dosemeters), (*X-ray dosimetry, Photographic film dosemeters), Accuracy, Corrections, Filters, Neutron dosimetry, Personnel dosimetry.

For abstract, see NSA 29 05, number 10223.

RL-73-125 PC$3.00/MF$1.45
Science Research Council, Chilton (Uk). Rutherford High Energy Lab.
CONVERT: THE PROGRAM LINK BETWEEN THE CRYSTAL FILM MEASUREMENT SYSTEM AND THE IBM 370/195.
W. S. Chapman. Oct 73, 17p
U.S. Sales Only.

Descriptors: (*Bubble chambers, *Data processing), (*Computer codes, *C codes), Data transmission, Equipment interfaces, Fortran, Ibm computers, Magnetic tapes, Particle tracks.

For abstract, see NSA 29 05, number 10270.

SLAC-Trans-158 PC$4.50/MF$1.45
Deutsches Elektronen-Synchrotron (Desy), Hamburg (F.R. Germany).
CALCULATION OF THE CURRENT IN AN IONIZATION CHAMBER IN A PULSED ELECTROMAGNETIC FIELD AND COMPARISON WITH MEASUREMENTS. APPLICATION TO RADIATION MONITORING IN ELECTRON STORAGE RINGS.
H. Dinter, and K. Tesch. Oct 73, 46p
Translation of DESY--73-22.

Descriptors: (*Doris storage ring, Ionization chambers), (*Ionization chambers, *Electric currents), Argon, Performance, Radiation monitors.

For abstract, see NSA 29 05, number 10177.

SSI-1973-19 PC$3.00/MF$1.45
Statens Straalskyddsinstitut, Stockholm (Sweden).
COMPARISON OF PULSE HEIGHT ANALYSIS AND VARIANCE MEASUREMENT FOR THE DETERMINATION OF DOSE MEAN SPECIFIC ENERGY.
L. G. Bengtsson, and L. Lindborg. Sep 73, 20p
CONF-730968-2
U.S. Sales Only.

Descriptors: (*Tissue-equivalent detectors, *Microdosimetry), (*Ionization chambers, Microdosimetry), (*Proportional counters, Microdosimetry), Cobalt 60, Dimensions, Noise, Pulse techniques, Radiation detectors, Radiobiology.

For abstract, see NSA 29 05, number 10224.

18E. Nuclear Power Plants

AAEC/LIB/BIb-402 PC$4.00/MF$1.45
Australian Atomic Energy Commission Research Establishment, Lucas Heights.
VENTILATION SYSTEMS AND COMPONENTS IN NUCLEAR POWER PLANTS AND RADIOACTIVE LABORATORIES.
P. J. Geue. Jul 73, 37p
U.S. Sales Only.

Descriptors: (*Nuclear power plants, Ventilation), (*Hot labs, Ventilation), (*Ventilation, *Bibliographies), Air filters.

For abstract, see NSA 29 05, number 10056.

AEC-tr-7428 PC$3.00/MF$1.45
Vereinigte Elektrizitaetswerke Westfalen a.G. (Vew), Dortmund (F.R. Germany).
DRY COOLING TOWER FOR THE 300 MW THTR NUCLEAR POWER PLANT SCHMEHAUSEN.
G. Hirschfelder. 1973, 20p
Translated from paper presented at VGB conference: power plant and environment, 1973.

Descriptors: (*Thtr-300 reactor, *Cooling towers), Design.

For abstract, see NSA 29 05, number 11789.

AES-11 PC$7.75/MF$1.45
Aktiebolaget Atomenergi, Studsvik (Sweden).
FIRE STUDIES OF PLASTIC ISOLATED ELECTRIC CABLES, SEALING CABLE LEAD-IN, INTERLOCKING CELLS, AND INTERLOCKING FLOORS.
G. Danielsson, and L. Elgh. 1973, 114p
In Swedish. U.S. Sales Only.

Descriptors: (*Nuclear power plants, Electric cables), (*Electric cables, *Fire resistance), Fires, Seals.

For abstract, see NSA 29 05, number 10113.

ANL-RDP-20 PC$7.60/MF$1.45
Argonne National Lab., Ill. (Usa).
REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT, SEPTEMBER 1973.
23 Oct 73, 156p
Contract W-31-109-eng-38

Descriptors: (*Lmfbr type reactors, *Research programs), (*Reactor components, Research programs), (*Reactor instrumentation, Research programs), (*Fuel elements, Research programs), Hot cells, Operation, Remote handling, Ebr-2 reactor, Reactor maintenance, Reactor operation, Distribution, Lake michigan, Monitoring, Thermal effluents, Corrosion, Impurities, Mechanical properties, Physical radiation effects, Plutonium oxides, Sodium, Stainless steels, Uranium dioxide, Design, Fuel cycle, Reactor kinetics, Reactor materials, Reactor safety, Testing, Treat reactor.

For abstract, see NSA 29 05, number 11858.

BNWL-tr-95(Pt.2) PC$5.50/MF$1.45
Cea Centre d'Etudes Nucleaires de Cadarache, 13 - Saint-Paul-les-Durance (France).
PRODUCTION OF FIRST RAPSODIE CORE. PART II. RESULTS OF PRODUCTION.
Y. Masselot, S. Bataller, M. Ganivet, H. Guillet, and A. Robillard. Jun 70, 67p
Translation of CEA-R--3501(2).

Descriptors: (*Rapsodie reactor, *Reactor cores), (*Plutonium oxides, *Fabrication), (*Uranium dioxide, Fabrication), Fuel pellets, Nuclear fuels, Specifications, Stoichiometry.

For abstract, see NSA 29 05, number 11859.

BNWL-tr-95(Pt.3) PC$3.50/MF$1.45
Cea Centre d'Etudes Nucleaires de Cadarache, 13 - Saint-Paul-les-Durance (France).
MANUFACTURE OF THE FIRST RAPSODIE CORE. THIRD PART. SPECIAL TECHNICAL PROBLEMS.
Y. Masselot, S. Bataller, M. Ganivet, H. Guillet, and A. Robillard. Mar 73, 30p
Translation of CEA-R--3501(3).

Descriptors: (*Rapsodie reactor, *Reactor cores), (*Plutonium oxides, *Fabrication), (*Uranium dioxide, Fabrication), Chemical composition, Nuclear fuels, Stoichiometry.

For abstract, see NSA 29 05, number 11860.

CEA-CONF-2153 PC$3.00/MF$1.45
USE OF CHANNELS FOR PHYSICS OF SOLIDS AND NEUTRON PHYSICS IN A REACTOR OF AVERAGE POWER: PERFORMANCE IMPROVEMENT.
13p CONF-721138-7, SM-165/25
In French. U.S. Sales Only.

Descriptors: (*Melusine-1 reactor, *Experimental channels), Isotope separation, Neutron choppers, On-line systems, Performance, Reactor experimental facilities.

For abstract, see NSA 29 05, number 11907.

CEA-CONF-2426 PC$3.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France). Div. De Metallurgie et d'Etude des Combustibles Nucleaires.
METHODS OF CONTROL DEVELOPED FOR THE FABRICATION OF THE FUEL ELEMENT FOR THE GRENOBLE HIGH FLUX REACTOR.
M. T. Destribats, F. Papezyk, and C. Pillet. Jan 73, 9p CONF-730606-5
In French. U.S. Sales Only.

Descriptors: (*Grenoble reactor, *Fuel elements), Boron, Data processing, Fabrication, Fuel plates, Spatial distribution, Uranium.

For abstract, see NSA 29 05, number 11908.

CEA-R-4495 PC$4.75/MF$1.45
Cea Centre d'Etudes de Bruyeres-le-Chatel, 92 - Montrouge (France).
APPLICATION OF GAS PHASE RADIOCHROMATOGRAPHY TO THE ANALYSIS OF FISSION GASES OF A FAST REACTOR.
D. Massimino. Dec 73, 54p
In French. U.S. Sales Only.

Descriptors: (*Failed element monitors, *Radiochromatography), (*Lmfbr type reactors, *Failed element detection), Cover gas, Fbr type reactors, Fission products, Sodium cooled reactors.

For abstract, see NSA 29 05, number 11861.

CEA-R-4541 PC$5.50/MF$1.45
Cea, 75 - Paris (France). Dept. Des Programmes.
HIERARCHIZATION METHOD FOR THE ELEMENTS OF A SYSTEM. AN ATTEMPT AT FORECASTING NUCLEAR ENERGY SYSTEM WITH ITS "SOCIETAL" CONTEXT.
J. C. Duperrin, and M. Godet. Dec 73, 68p
In French. U.S. Sales Only.

Descriptors: (*Nuclear energy, *Planning), (*Sociology, Nuclear energy), Power plants, Power reactors.

For abstract, see NSA 29 05, number 12442.

CONF-730668-1 PC$4.50/MF$1.45
Clarke Chapman - John Thompson LTD., Gateshead (Uk).
USE OF NONMETALLIC MATERIALS WITH HIGH-TEMPERATURE GAS-COOLED REACTORS WITH SPECIAL REFERENCE TO HEAT

EXCHANGERS FOR POWER AND PROCESS PLANTS.
W. Hryniszak. 6 Jun 73, 47p
U.S. Sales Only.

Descriptors: (*Htgr type reactors, Heat exchangers), (*Heat exchangers, Ceramics), (*Ceramics, *Uses), (*Silicon nitrides, *Fabrication), Aluminium oxides, Gas turbines, Glass, Mechanical properties, Nuclear power, Physical properties, Production, Silicon carbides, Silicon oxides, Steels, Very high temperature.

For abstract, see NSA 29 05, number 11790.

DOCKET-RESARA-22 PC$18.25/MF$1.45
Westinghouse Electric Corp., Pittsburgh, PA. (Usa). Pwr Systems Div.
WESTINGHOUSE NUCLEAR ENERGY SYSTEMS. REFERENCE SAFETY ANALYSIS REPORT, VOLUME I, AMENDMENT 5 (CONSOLIDATED VERSION).
Nov 73, 323p

Descriptors: Design, Electrical equipment, Environment, Floods, Mechanical structures, Pipelines, Pressurizers, Pwr type reactors, Reactor components, Reactor instrumentation, Ruptures, Seismic effects, Standards, Wind.

For abstract, see NSA 29 05, number 12340.

DOCKET-RESARA-23 PC$22.25/MF$1.45
Westinghouse Electric Corp., Pittsburgh, PA. (Usa). Pwr Systems Div.
WESTINGHOUSE NUCLEAR ENERGY SYSTEMS. REFERENCE SAFETY ANALYSIS REPORT, VOLUME II, AMENDMENT 5 (CONSOLIDATED VERSION).
Nov 73, 405p

Descriptors: Control rod drives, Design, Fuel assemblies, Fuel elements, Hydraulics, Pwr type reactors, Standards.

For abstract, see NSA 29 05, number 12341.

DOCKET-RESARA-24 PC$23.50/MF$1.45
Westinghouse Electric Corp., Pittsburgh, PA. (Usa). Pwr Systems Div.
WESTINGHOUSE NUCLEAR ENERGY SYSTEMS. REFERENCE SAFETY ANALYSIS REPORT, VOLUME III, AMENDMENT 5 (CONSOLIDATED VERSION).
Nov 73, 427p

Descriptors: Containment, Eccs, Hydraulics, Pressure vessels, Pwr type reactors, Reactor cooling systems.

For abstract, see NSA 29 05, number 12342.

DOCKET-RESARA-25 PC$18.75/MF$1.45
Westinghouse Electric Corp., Pittsburgh, PA. (Usa). Pwr Systems Div.
WESTINGHOUSE NUCLEAR ENERGY SYSTEMS. REFERENCE SAFETY ANALYSIS REPORT, VOLUME IV, AMENDMENT 5 (CONSOLIDATED VERSION).
Apr 73, 332p

Descriptors: Control, Display devices, Pwr type reactors, Reactor control systems, Reactor instrumentation, Reactor operation, Reactor safety, Reactor shutdown, Scram.

For abstract, see NSA 29 05, number 12343.

DOCKET-RESARA-26 PC$20.75/MF$1.45
Westinghouse Electric Corp., Pittsburgh, PA. (Usa). Pwr Systems Div.
WESTINGHOUSE NUCLEAR ENERGY SYSTEMS. REFERENCE SAFETY ANALYSIS REPORT, VOLUME V, AMENDMENT 5 (CONSOLIDATED VERSION).
Apr 73, 375p

Descriptors: Air conditioning, Cooling, Environment, Fuel elements, Gaseous wastes, Heating, Liquid wastes, Pwr type reactors, Radiation monitoring, Radioactive waste disposal, Remote handling, Solid wastes, Storage, Ventilation, Waste management.

For abstract, see NSA 29 05, number 12344.

DOCKET-RESARA-27 PC$18.25/MF$1.45
Westinghouse Electric Corp., Pittsburgh, PA. (Usa). Pwr Systems Div.
WESTINGHOUSE NUCLEAR ENERGY SYSTEMS. REFERENCE SAFETY ANALYSIS REPORT, VOLUME VI, AMENDMENT 5 (CONSOLIDATED VERSION).
Jun 72, 324p

Descriptors: Licenses, Management, Personnel, Pwr type reactors, Reactor accidents, Reactor operation, Standards, Testing, Transients.

For abstract, see NSA 29 05, number 12345.

DOCKET-RESARA-28 PC$17.00/MF$1.45
Westinghouse Electric Corp., Pittsburgh, PA. (Usa). Pwr Systems Div.
WESTINGHOUSE NUCLEAR ENERGY SYSTEMS. REFERENCE SAFETY ANALYSIS REPORT, VOLUME VII, AMENDMENT 5 (CONSOLIDATED VERSION).
Oct 72, 297p

Descriptors: Computer codes, Cooling, Departure nucleate boiling, Pipelines, Pwr type reactors, Reactor accidents, Ruptures, Standards, Steam.

For abstract, see NSA 29 05, number 12346.

DOCKET-RESARA-29 PC$23.00/MF$1.45
Westinghouse Electric Corp., Pittsburgh, PA. (Usa). Pwr Systems Div.
WESTINGHOUSE NUCLEAR ENERGY SYSTEMS. REFERENCE SAFETY ANALYSIS REPORT, VOLUME VIII, AMENDMENT 5 (CONSOLIDATED VERSION).
Apr 73, 416p

Descriptors: Construction, Design, Pwr type reactors, Quality assurance, Specifications, Standards.

For abstract, see NSA 29 05, number 12347.

DOCKET-STN-50470-1 PC$32.75/MF$1.45
Combustion Engineering, Inc., Windsor, Conn. (Usa).
PWR NUCLEAR STEAM SUPPLY SYSTEM 80. PSAR, VOLUME 1.
18 Dec 73, 613p

Descriptors: Design, Hydraulics, Mechanical structures, Pipelines, Pressure vessels, Pumps, Pwr/80 type reactors, Reactivity, Reactor components, Reactor cooling systems, Reactor sites, Standards, Steam generators, Valves.

For abstract, see NSA 29 05, number 12348.

DOCKET-50010-207 PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill. (Usa).
DRESDEN NUCLEAR POWER STATION, UNIT 1. UNPLANNED RADIOACTIVE RELEASE FROM RADWASTE.
29 Nov 73, 3p

Descriptors: (*Dresden-1 reactor, *Radioactive waste disposal), Beta particles, Gamma radiation, Liquid wastes, Steam generators, Strontium 90, Tanks.

For abstract, see NSA 29 05, number 12220.

DOCKET-50133-142 PC$3.00/MF$1.45
Pacific Gas and Electric CO., San Francisco, Calif. (Usa).
HUMBOLDT BAY POWER PLANT, UNIT 3. MALFUNCTION OF THE PROPANE ENGINE DRIVEN GENERATOR.
5 Dec 73, 3p

Descriptors: (*Humboldt bay reactor, *Electric generators), Failures, Motors.

For abstract, see NSA 29 05, number 12221.

DOCKET-50155-178 PC$3.00/MF$1.45
Yankee Atomic Electric CO., Westboro, Mass. (Usa).
BIG ROCK POINT REACTOR. ABNORMAL OCCURRENCE AO-11-73: THE 6" OFF-GAS BYPASS VALVE ON THE CONDENSER OFF-GAS SYSTEM WAS FOUND IN THE OPEN POSITION; ABNORMAL OCCURRENCE AO-12-73: MALFUNCTION OF FOUR HIGH CONDENSER PRESSURE SCRAM BYPASS PRESSURE SWITCHES; ABNORMAL OCCURRENCE AO-13-73: THE COMPENSATING POWER SUPPLY FOR THE CHANNEL 4 LOG N/PERIOD MONITOR WAS FOUND TO BE REVERSED IN POLARITY.
13 Nov 73, 2p

Descriptors: (*Big rock point reactor, *Neutron monitors), Bypasses, Calibration, Off-gas systems, Operation, Power supplies, Reactor fueling, Reactor start-up, Scram, Steam condensers, Switches, Valves.

For abstract, see NSA 29 05, number 12222.

DOCKET-50155-181 PC$3.00/MF$1.45
Consumers Power CO., Jackson, Mich. (Usa).
BIG ROCK POINT NUCLEAR PLANT. DURING DRAINING OF FUEL POOL, A SPENT FUEL ROD WAS FOUND ON THE POOL FLOOR.
20 Nov 73, 2p

Descriptors: (*Big rock point reactor, *Spent fuel elements), Spent fuel storage, Storage.

For abstract, see NSA 29 05, number 12223.

DOCKET-50155-182 PC$3.00/MF$1.45
Consumers Power CO., Jackson, Mich. (Usa).
BIG ROCK POINT NUCLEAR PLANT. ABNORMAL OCCURRENCE REPORT AO-16-73: A SAMPLE OF WATER FROM THE SHELL SIDE OF THE EMERGENCY CONDENSER WAS FOUND TO CONTAIN AN ABNORMAL AMOUNT OF SHORT-LIVED ACTIVITY IN THE FORM OF ENTRAINED FISSION GAS.
27 Nov 73, 1p

Descriptors: Big rock point reactor, Fission products, Radioactive wastes, Radioactivity, Water.

For abstract, see NSA 29 05, number 12224.

DOCKET-50155-183 PC$3.00/MF$1.45
Consumers Power CO., Jackson, Mich. (Usa).
BIG ROCK POINT NUCLEAR PLANT. UNUSUAL EVENT: AN OBSERVED REDUCTION IN THE ABILITY OF THE RESERVE NITROGEN SUPPLY SYSTEM TO OPERATE THE CONTAINMENT SPHERE VENTILATION VALVES.
27 Nov 73, 2p

Descriptors: (*Big rock point reactor, *Containment), Failures, Nitrogen, Operation, Solenoids, Valves, Ventilation.

For abstract, see NSA 29 05, number 12225.

DOCKET-50206-253 PC$3.00/MF$1.45
Southern California Edison CO., Rosemead (Usa).
SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 1. INCIDENT REPORT: EXCES-

SIVE SMOKE WAS OBSERVED COMING FROM THE EXHAUST OF NO. 2 DIESEL.
20 Nov 73, 2p

Descriptors: (*San onofre-1 reactor, *Diesel engines), Aerosols, Electric power, Performance, Pumps, Residues.

For abstract, see NSA 29 05, number 12226.

DOCKET-50213-247 PC$3.00/MF$1.45
Connecticut Yankee Atomic Power CO., East Hampton (Usa).
HADDAM NECK PLANT. ABNORMAL OCCURRENCE REPORT NO. 73-8: FAILURE OF STEAM GENERATOR SEISMIC SUPPORT HOLD-DOWN BOLTS.
19 Sep 73, 2p

Descriptors: (*Connecticut yankee reactor, *Steam generators), Failures, Fasteners, Seismic effects, Supports, Ultrasonic testing.

For abstract, see NSA 29 05, number 12227.

DOCKET-50219-342 PC$3.00/MF$1.45
Jersey Central Power and Light CO., Morristown, N.J. (Usa).
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. ABNORMAL OCCURRENCE: CLOSED COOLING WATER SYSTEM LEAKAGE.
8 Nov 73, 3p

Descriptors: (*Oyster creek-1 reactor, *Reactor cooling systems), Cesium 134, Cesium 137, Heat exchangers, Leaks, Radioactivity.

For abstract, see NSA 29 05, number 12228.

DOCKET-50219-349 PC$3.00/MF$1.45
Jersey Central Power and Light CO., Morristown, N.J. (Usa).
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. PRELIMINARY ABNORMAL OCCURRENCE REPORT NO. 73-26: FAILURE TO SET THE AVERAGE POWER RANGE MONITOR SCRAM AND ROD BLOCK SET POINTS TO THE CONSERVATIVE SPECIFIED VALUES.
11 Oct 73, 3p

Descriptors: (*Oyster creek-1 reactor, *Reactor protection systems), Calibration, Scram.

For abstract, see NSA 29 05, number 12229.

DOCKET-50219-350 PC$3.00/MF$1.45
Jersey Central Power and Light CO., Morristown, N.J. (Usa).
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. PRELIMINARY ABNORMAL OCCURRENCE REPORT NO. AO-73-23: FAILURE OF DIFFERENTIAL PRESSURE SWITCH DPS 66A TO TRIP AND THEREBY ACTUATE THE REACTOR BUILDING TO TORUS VACUUM BREAKER BLOCK VALVES, V-26-16 AND 18.
25 Sep 73, 3p

Descriptors: (*Oyster creek-1 reactor, *Containment systems), Failures, Pressure gages, Switches.

For abstract, see NSA 29 05, number 12230.

DOCKET-50220-193 PC$3.00/MF$1.45
Niagara Mohawk Power Corp., Syracuse, N.Y. (Usa).
NINE MILE POINT NUCLEAR STATION, UNIT 1. DURING ROUTINE CALIBRATION OF LPRM AND SUBSEQUENT CORE POWER DISTRIBUTION CALCULATION FUEL BUNDLE SEGMENTS WERE FOUND TO BE OPERATING SLIGHTLY IN EXCESS OF THE ALLOWABLE AVERAGE PLANAR LHGR.
1973, 1p

Descriptors: (*Nine mile point-1 reactor, *Power density), Fuel element clusters, Reactor cores, Reactor lattice parameters.

For abstract, see NSA 29 05, number 12231.

DOCKET-50220-198 PC$3.00/MF$1.45
Niagara Mohawk Power Corp., Syracuse, N.Y. (Usa).
NINE MILE POINT NUCLEAR STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT NO. AO-73-11-20: FAILURE OF ELEVEN CONTROL ROD DRIVES TO INSERT TO NOTCH POSITION FOLLOWING A REACTOR SCRAM.
28 Nov 73, 2p

Descriptors: (*Nine mile point-1 reactor, *Control rod drives), Coolants, Failures, Flow rate, Leaks, Scram, Seals, Transients.

For abstract, see NSA 29 05, number 12232.

DOCKET-50237-426 PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill. (Usa).
DRESDEN NUCLEAR POWER STATION, UNIT 2. ADDITIONAL DATA ON ISOLATION OF ISOLATION CONDENSER SYSTEM.
21 Nov 73, 2p

Descriptors: (*Dresden-2 reactor, *Containment systems), Calibration, Pressure gages, Switches.

For abstract, see NSA 29 05, number 12233.

DOCKET-50237-429 PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill. (Usa).
DRESDEN NUCLEAR POWER STATION, UNIT 2. ABNORMAL OCCURRENCE REPORT: THE HPCI SYSTEM WAS DECLARED TO BE INOPERABLE DUE TO A 125 VOLT AND 250 VOLT GROUND.
30 Nov 73, 2p

Descriptors: (*Dresden-2 reactor, *Eccs), Electric power, Leaks, Pumps, Valves.

For abstract, see NSA 29 05, number 12234.

DOCKET-50244-217 PC$3.00/MF$1.45
Rochester Gas and Electric Corp., N.Y. (Usa).
ROBERT EMMETT GINNA NUCLEAR POWER PLANT, UNIT 1. ABNORMAL OCCURRENCE REPORT NO. AO-73-6 AND 73-7: FAILURE OF SENSING LINE ON "B" AUXILIARY FEEDWATER PUMP.
1 Aug 73, 3p

Descriptors: (*Ginna-1 reactor, *Steam generators), Failures, Feedwater, Motion, Orifices, Pipelines, Pumps, Valves.

For abstract, see NSA 29 05, number 12235.

DOCKET-50244-218 PC$3.00/MF$1.45
Rochester Gas and Electric Corp., N.Y. (Usa).
ROBERT EMMETT GINNA NUCLEAR POWER PLANT, UNIT 1. ABNORMAL OCCURRENCE REPORT NO. AO-73-9: EXCESSIVE REACTOR COOLANT COOLDOWN RATE; ABNORMAL OCCURRENCE REPORT NO. AO-73-10: MALFUNCTION OF SAFETY INJECTION PUMP SUCTION TRANSFER FROM BORIC ACID STORAGE TANKS TO REFUELING WATER STORAGE TANK.
23 Oct 73, 4p

Descriptors: (*Ginna-1 reactor, *Eccs), Coolants, Cooling, Failures, Losses, Power, Pumps, Reactor cooling systems, Temperature gradients.

For abstract, see NSA 29 05, number 12236.

DOCKET-50244-221 PC$17.00/MF$1.45
Rochester Gas and Electric Corp., N.Y. (Usa).
ROBERT EMMETT GINNA NUCLEAR POWER PLANT, UNIT 1. USAEC FINAL ENVIRONMENTAL STATEMENT.
Dec 73, 299p

Descriptors: (*Ginna-1 reactor, *Environment), Climates, Cost benefit analysis, Ecology, Electric power, Geography, Geology, Hydrology, Radiation monitoring, Reactor operation, Reactor sites.

For abstract, see NSA 29 05, number 12237.

DOCKET-50247-154 PC$3.00/MF$1.45
Consolidated Edison CO. Of New York, Inc., New York (Usa).
INDIAN POINT STATION, UNIT 2. INCIDENT REPORT: A TURBINE TRIP OCCURRED DUE TO HIGH FEEDWATER IN STEAM GENERATOR NO. 23 RESULTING IN SHUTDOWN OF THE OPERATING MAIN BOILER FEED PUMP WHICH CAUSED THE LEVEL OF ALL FOUR STEAM GENERATORS TO DECREASE.
14 Nov 73, 3p

Descriptors: (*Indian point-2 reactor, *Steam generators), Containment, Control, Cracks, Failures, Feedwater, Leaks, Pipelines, Pumps, Scram, Turbines, Water.

For abstract, see NSA 29 05, number 12238.

DOCKET-50247-157 PC$3.00/MF$1.45
Consolidated Edison CO. Of New York, Inc., New York (Usa).
INDIAN POINT STATION, UNIT 2. ABNORMAL OCCURRENCE REPORT NO. AO-3-2-17: DURING MAINTENANCE OF THE CLOSURE MECHANISM OF THE 80' ELEVATION OUTER DOOR OF THE VAPOR CONTAINER, THE INNER DOOR WAS PARTIALLY OPENED FOR A SHORT PERIOD.
17 Sep 73, 1p

Descriptors: (*Indian point-2 reactor, *Containment), Doors, Maintenance, Openings.

For abstract, see NSA 29 05, number 12239.

DOCKET-50247-159 PC$3.00/MF$1.45
Consolidated Edison CO. Of New York, Inc., New York (Usa).
INDIAN POINT STATION, UNIT 2. ABNORMAL OCCURRENCE REPORT NO. AO-3-2-13: LOSS OF GENERATOR FIELD RELAY ACTION RESULTED IN A TRIP.
12 Oct 73, 2p

Descriptors: (*Indian point-2 reactor, *Electric power), Electric generators, Failures, Radioactivity, Relays, Scram.

For abstract, see NSA 29 05, number 12240.

DOCKET-50247-162 PC$3.00/MF$1.45
Consolidated Edison CO. Of New York, Inc., New York (Usa).
INDIAN POINT STATION, UNIT 2. ABNORMAL OCCURRENCE REPORT NO. AO-3-2-15: LEAKS WERE OBSERVED AT THE 3/4 INCH PIPE TO SOCKET WELD BRANCH CONNECTIONS FOR VENTS S-47 AND S-51.
12 Nov 73, 3p

Descriptors: (*Indian point-2 reactor, *Reactor cooling systems), Failures, Mechanical vibrations, Pipelines, Valves, Welded joints.

For abstract, see NSA 29 05, number 12241.

DOCKET-50247-163 PC$3.00/MF$1.45
Consolidated Edison CO. Of New York, Inc., New York (Usa).
INDIAN POINT STATION, UNIT 2. INCIDENT REPORT: A TURBINE TRIP OCCURRED DUE TO HIGH FEEDWATER IN THE STEAM

GENERATOR NO. 23 RESULTING IN A SHUTDOWN OF THE OPERATING MAIN BOILER FEED PUMP.
14 Nov 73, 3p

Descriptors: (*Indian point-2 reactor, *Steam generators), Cracks, Feedwater, Mechanical vibrations, Operation, Performance, Pipelines, Pumps, Scram, Steam turbines.

For abstract, see NSA 29 05, number 12242.

DOCKET-50249-315 PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill. (Usa).
DRESDEN NUCLEAR POWER STATION, UNIT 3. FAILURE OF DIESEL GENERATOR AIR STARTING SYSTEM.
6 Nov 73, 2p

Descriptors: (*Dresden-3 reactor, *Diesel engines), Air, Failures, Mechanical vibrations, Operation, Pipelines, Solenoids.

For abstract, see NSA 29 05, number 12243.

DOCKET-50249-319 PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill. (Usa).
DRESDEN NUCLEAR POWER STATION, UNIT 3. ABNORMAL OCCURRENCE: 2/3 CORE HEIGHT LEVEL SENSORS FOUND TO BE OUT OF CALIBRATION.
19 Nov 73, 2p

Descriptors: (*Dresden-3 reactor, *Containment spray systems), Calibration, Level indicators, Switches.

For abstract, see NSA 29 05, number 12244.

DOCKET-50249-321 PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill. (Usa).
DRESDEN NUCLEAR POWER STATION, UNIT 3. ABNORMAL OCCURRENCE: MALFUNCTION OF CORE SPRAY SYSTEM M.O. VALVE 1402-38A.
15 Nov 73, 2p

Descriptors: (*Dresden-3 reactor, *Core spray systems), Failures, Valves.

For abstract, see NSA 29 05, number 12245.

DOCKET-50250-183 PC$3.00/MF$1.45
Florida Power and Light CO. (Usa).
TURKEY POINT PLANT, UNIT 3. ABNORMAL OCCURRENCE REPORT NO. AO-3-72-8 (SUPPLEMENT): EVALUATION OF TESTS AND INSPECTIONS FOLLOWING THE NO. 3 BATTERY CHARGER FIRE.
26 Nov 73, 4p

Descriptors: (*Turkey point-3 reactor, *Electrical equipment), Electric batteries, Fires.

For abstract, see NSA 29 05, number 12246.

DOCKET-50251-170 PC$3.00/MF$1.45
Florida Power and Light CO. (Usa).
TURKEY POINT PLANT, UNIT 4. ABNORMAL OCCURRENCE REPORT NO. AO-4-73-3, SUPPLEMENT: RESULTS OF INSPECTIONS TO DETERMINE THE CAUSE OF NO. 4A RESIDUAL HEAT REMOVAL PUMP LEAKAGE.
24 Nov 73, 3p

Descriptors: (*Turkey point-4 reactor, *After-heat removal), Gaskets, Inspection, Leaks, Pumps, Reactor cooling systems, Seals, Springs.

For abstract, see NSA 29 05, number 12247.

DOCKET-50254-302 PC$3.00/MF$1.45
Commonwealth Edison CO., Cordova, Ill. (Usa).
QUAD-CITIES STATION, UNIT 1. ABNORMAL OCCURRENCE: THE REACTOR COOLANT LEAKAGE INTO THE PRIMARY CONTAINMENT EXCEEDED 5 GPM.
29 Nov 73, 3p

Descriptors: (*Quad cities-1 reactor, *Reactor cooling systems), Containment, Coolants, Leaks, Pumps, Valves.

For abstract, see NSA 29 05, number 12248.

DOCKET-50259-225 PC$23.75/MF$1.45
Tennessee Valley Authority, Chattanooga (Usa).
BROWNS FERRY NUCLEAR POWER STATION, UNITS 1, 2, AND 3. FINAL ENVIRONMENTAL STATEMENT, VOLUME 1.
1 Sep 72, 432p DOCKET-50260-128, DOCKET-50296-116

Descriptors: (*Browns ferry-1 reactor, *Environment), (*Browns ferry-2 reactor, Environment), (*Browns ferry-3 reactor, Environment), Cost benefit analysis.

For abstract, see NSA 29 05, number 12249.

DOCKET-50259-232 PC$3.00/MF$1.45
Tennessee Valley Authority, Chattanooga (Usa).
BROWNS FERRY NUCLEAR POWER STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT BFAO-7336W: HPCI INVERTER POWER SUPPLY FUSE FAILURE.
21 Nov 73, 3p

Descriptors: (*Browns ferry-1 reactor, *Electric fuses), Failures, Power supplies.

For abstract, see NSA 29 05, number 12250.

DOCKET-50259-234 PC$3.00/MF$1.45
Tennessee Valley Authority, Chattanooga (Usa).
BROWNS FERRY NUCLEAR POWER STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT BFAO-7337-W: MALFUNCTION OF CORE SPRAY PUMP DISCHARGE PRESSURE SWITCH.
23 Nov 73, 3p

Descriptors: (*Browns ferry-1 reactor, *Eccs), Calibration, Core spray systems, Pumps, Relays, Switches.

For abstract, see NSA 29 05, number 12251.

DOCKET-50259-244 PC$3.00/MF$1.45
Tennessee Valley Authority, Chattanooga (Usa).
BROWNS FERRY NUCLEAR POWER STATION, UNIT 1. ENVIRONMENTAL ABNORMAL OCCURRENCE REPORT BF EAO-7353W--7356W: FISH IMPINGEMENT ESTIMATES.
21 Nov 73, 2p

Descriptors: (*Browns ferry-1 reactor, *Fishes), Environment, Mortality.

For abstract, see NSA 29 05, number 12252.

DOCKET-50259-245 PC$3.00/MF$1.45
Tennessee Valley Authority, Chattanooga (Usa).
BROWNS FERRY NUCLEAR POWER STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT BFAO-7340W: MALFUNCTION OF HPCI STEAMFLOW EXCESSIVE PRESSURE SWITCHES.
23 Nov 73, 3p

Descriptors: (*Browns ferry-1 reactor, *Switches), Calibration, Pressure gages.

For abstract, see NSA 29 05, number 12253.

DOCKET-50259-246 PC$3.00/MF$1.45
Tennessee Valley Authority, Chattanooga (Usa).
BROWNS FERRY NUCLEAR POWER STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT BFAO-7338W: RCIC AND HPCI FAILURES.
23 Nov 73, 3p

Descriptors: (*Browns ferry-1 reactor, *Eccs), Failures, Reactor cooling systems, Valves.

For abstract, see NSA 29 05, number 12254.

DOCKET-50259-247 PC$3.00/MF$1.45
Tennessee Valley Authority, Chattanooga (Usa).
BROWNS FERRY NUCLEAR POWER STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT BFAO-7339W: MALFUNCTION OF REACTOR PROTECTION SYSTEM CONDENSER LOW-VACUUM SWITCH.
23 Nov 73, 3p

Descriptors: (*Browns ferry-1 reactor, *Reactor protection systems), Calibration, Steam condensers, Switches.

For abstract, see NSA 29 05, number 12255.

DOCKET-50259-248 PC$3.00/MF$1.45
Tennessee Valley Authority, Chattanooga (Usa).
BROWNS FERRY NUCLEAR POWER STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT BFAO-7341W: MALFUNCTION OF REACTOR PROTECTION SYSTEM WATER-LEVEL SWITCH.
26 Nov 73, 3p

Descriptors: (*Browns ferry-1 reactor, *Reactor protection systems), Calibration, Level indicators, Switches.

For abstract, see NSA 29 05, number 12256.

DOCKET-50259-250 PC$3.00/MF$1.45
Tennessee Valley Authority, Chattanooga (Usa).
BROWNS FERRY NUCLEAR POWER STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT BFAO-7343W: SIGNIFICANT VIBRATION IN TORUS AND TORUS-RING HEADER UPON OPENING RELIEF VALVES DURING STARTUP TESTING.
28 Nov 73, 2p

Descriptors: (*Browns ferry-1 reactor, *Containment systems), Mechanical vibrations, Valves.

For abstract, see NSA 29 05, number 12257.

DOCKET-50259-255 PC$3.00/MF$1.45
Tennessee Valley Authority, Chattanooga (Usa).
BROWNS FERRY NUCLEAR POWER STATION, UNIT 1. ENVIRONMENTAL ABNORMAL OCCURRENCE REPORT BF EAO-7357W-7363W: FISH IMPINGEMENT ESTIMATES.
30 Nov 73, 2p

Descriptors: (*Browns ferry-1 reactor, *Fishes), Environment, Mortality.

For abstract, see NSA 29 05, number 12258.

DOCKET-50261-282 PC$3.00/MF$1.45
Carolina Power and Light CO., Raleigh, N.C. (Usa).
H. B. ROBINSON PLANT, UNIT 2. ABNORMAL OCCURRENCE REPORT NO. 73-70: PRIMARY TO SECONDARY LEAK IN STEAM GENERATOR C.
23 Nov 73, 2p

Descriptors: (*Robinson-2 reactor, *Steam generators), Leaks, Primary coolant circuits, Secondary coolant circuits.

For abstract, see NSA 29 05, number 12259.

DOCKET-50261-283 PC$3.00/MF$1.45
Carolina Power and Light CO., Raleigh, N.C. (Usa).
H. B. ROBINSON PLANT, UNIT 2. MONTHLY REPORT OF PRIMARY AND SECONDARY ACTIVITY MEASUREMENTS AND EFFLUENT DISCHARGE ACTIVITY LEVELS, OCTOBER 1973.
19 Nov 73, 2p

Descriptors: (*Robinson-2 reactor, *Primary coolant circuits), Iodine, Radioactive waste disposal, Secondary coolant circuits, Steam generators.

For abstract, see NSA 29 05, number 12260.

DOCKET-50263-273 PC$3.00/MF$1.45
Northern States Power CO., Minneapolis, Minn. (Usa).
MONTICELLO NUCLEAR GENERATING PLANT, UNIT 1. ABNORMAL OCCURRENCE: REACTOR BUILDING TO SUPPRESSION CHAMBER VACUUM BREAKER CHECK VALVE, DWV 8-1 WOULD NOT OPERATE FREELY.
9 Nov 73, 1p

Descriptors: (*Monticello reactor, *Containment), Calibration, Performance, Valves.

For abstract, see NSA 29 05, number 12261.

DOCKET-50263-274 PC$3.00/MF$1.45
Northern States Power CO., Minneapolis, Minn. (Usa).
MONTICELLO NUCLEAR GENERATING PLANT, UNIT 1. ABNORMAL OCCURRENCE: STANDBY LIQUID CONTROL TANK LEVEL INDICATORS WERE IMPROPERLY CALIBRATED.
14 Nov 73, 1p

Descriptors: (*Monticello reactor, *Fluid poison control), Boric acid, Calibration, Core spray systems, Eccs, Level indicators, Tanks.

For abstract, see NSA 29 05, number 12262.

DOCKET-50263-275 PC$3.00/MF$1.45
Northern States Power CO., Minneapolis, Minn. (Usa).
MONTICELLO NUCLEAR GENERATING PLANT, UNIT 1. MALFUNCTION OF MSIV-2-80A.
3 Aug 73, 1p

Descriptors: (*Monticello reactor, *Valves), Cleaning, Performance testing.

For abstract, see NSA 29 05, number 12263.

DOCKET-50263-276 PC$3.00/MF$1.45
Northern States Power CO., Minneapolis, Minn. (Usa).
MONTICELLO NUCLEAR GENERATING PLANT, UNIT 1. ABNORMAL OCCURRENCE: MALFUNCTION OF SUPPRESSION CHAMBER TO REACTOR BUILDING PRIMARY CONTAINMENT CHECK VALVE.
19 Nov 73, 2p

Descriptors: (*Monticello reactor, *Containment systems), Failures, Pressure suppression, Valves.

For abstract, see NSA 29 05, number 12264.

DOCKET-50263-281 PC$8.75/MF$1.45
Northern States Power CO., Minneapolis, Minn. (Usa).
MONTICELLO NUCLEAR GENERATING PLANT, UNIT 1. SECOND RELOAD SUBMITTAL.
19 Nov 73, 131p

Descriptors: (*Monticello reactor, *Reactor fueling), Design, Fuel assemblies, Reactor cores, Uranium 235.

For abstract, see NSA 29 05, number 12265.

DOCKET-50270-138 PC$3.00/MF$1.45
Duke Power CO., Charlotte, N.C. (Usa).
OCONEE NUCLEAR STATION, UNIT 2. ABNORMAL OCCURRENCE REPORT NO. AO-73-3: REACTOR COOLANT SYSTEM HEATUP LIMITATIONS.
23 Nov 73, 7p

Descriptors: (*Oconee-2 reactor, *Reactor cooling systems), Heating, Pressure dependence, Pressure vessels, Reactor start-up, Stresses, Temperature dependence.

For abstract, see NSA 29 05, number 12266.

DOCKET-50271-257 PC$3.00/MF$1.45
Vermont Yankee Nuclear Power Corp., Rutland (Usa).
VERMONT YANKEE NUCLEAR POWER STATION. ABNORMAL OCCURRENCE REPORT NO. AO-73-27: AN APPARENT DETONATION IN THE OFF-GAS SYSTEM CAUSED SUFFICIENT BACK PRESSURE TO FRACTURE THE AIR EJECTOR RUPTURE DISC.
10 Sep 73, 2p

Descriptors: (*Vermont yankee reactor, *Off-gas systems), Explosions, Failures, Filters, Ruptures, Stack disposal, Turbines, Ventilation.

For abstract, see NSA 29 05, number 12267.

DOCKET-50271-260 PC$3.00/MF$1.45
Vermont Yankee Nuclear Power Corp., Rutland (Usa).
VERMONT YANKEE NUCLEAR POWER STATION. DATA ON CHANNEL BOX WEAR.
16 Nov 73, 10p

Descriptors: (*Vermont yankee reactor, *Fuel channels), Control elements, Coolants, Flow rate, Fuel assemblies, Mechanical vibrations, Supports, Wear.

For abstract, see NSA 29 05, number 12268.

DOCKET-50271-262 PC$3.00/MF$1.45
Vermont Yankee Nuclear Power Corp., Rutland (Usa).
VERMONT YANKEE NUCLEAR POWER STATION. ABNORMAL OCCURRENCE REPORT NO. AO-73-32: FAILURE OF BOTH GASKETS ON THE GLAND SEAL EXHAUST CONDENSER OF THE HPCI SYSTEM.
28 Nov 73, 2p

Descriptors: (*Vermont yankee reactor, *Eccs), Failures, Gaskets, Heat exchangers, Seals.

For abstract, see NSA 29 05, number 12269.

DOCKET-50275-69 PC$3.00/MF$1.45
Pacific Gas and Electric CO., San Francisco, Calif. (Usa).
DIABLO CANYON NUCLEAR POWER PLANT, UNIT 1. REPORT ON INSPECTION OF STAINLESS STEEL PIPING WELDS.
1 Dec 73, 4p

Descriptors: (*Diablo canyon-1 reactor, *Pipelines), Inspection, Performance, Stainless steels, Welded joints.

For abstract, see NSA 29 05, number 12270.

DOCKET-50277-162 PC$3.00/MF$1.45
Philadelphia Electric CO., PA. (Usa).
PEACH BOTTOM ATOMIC POWER STATION, UNIT 2. ABNORMAL OCCURRENCE: TWO PRESSURE SWITCHES MONITORING PRIMARY SYSTEM PRESSURE AND A REACTOR VESSEL LEVEL SWITCH WERE FOUND TO BE OUT OF CALIBRATION.
23 Nov 73, 3p

Descriptors: (*Peach bottom-2 reactor, *Pressure vessels), Calibration, Level indicators, Pressure gages, Primary coolant circuits, Switches.

For abstract, see NSA 29 05, number 12271.

DOCKET-50277-165 PC$3.00/MF$1.45
Philadelphia Electric CO., PA. (Usa).
PEACH BOTTOM ATOMIC POWER STATION, UNIT 2. ABNORMAL OCCURRENCE REPORT: MALFUNCTION OF REACTOR LEVEL SWITCH LIS-2-2-3-101B.
1 Dec 73, 2p

Descriptors: (*Peach bottom-2 reactor, *Level indicators), Calibration, Reactor shutdown, Switches.

For abstract, see NSA 29 05, number 12272.

DOCKET-50280-195 PC$3.00/MF$1.45
Virginia Electric and Power CO., Richmond (Usa).
SURRY POWER STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT NO. AO-S1-73-14: FAILURE OF OVERHEAD GAS COMPRESSOR HIGH PRESSURE ALARM.
23 Nov 73, 9p

Descriptors: (*Surry-1 reactor, *Compressors), Alarm systems, Failures, Gases.

For abstract, see NSA 29 05, number 12273.

DOCKET-50281-163 PC$3.00/MF$1.45
Virginia Electric and Power CO., Richmond (Usa).
SURRY POWER STATION, UNIT 2. ABNORMAL OCCURRENCE REPORT NO. AO-S2-73-10: FAILURE OF SAFETY INJECTION/CHARGING PUMP 2-CH-P-1B TO START ON A SAFETY INJECTION SIGNAL.
23 Nov 73, 8p

Descriptors: (*Surry-2 reactor, *Eccs), Failures, Pumps, Signals.

For abstract, see NSA 29 05, number 12274.

DOCKET-50281-164 PC$3.00/MF$1.45
Virginia Electric and Power CO., Richmond (Usa).
SURRY POWER STATION, UNIT 2. ABNORMAL OCCURRENCE REPORT NO. AO-S2-73-11: FAILURE OF MOV-FW-251B TO FULLY OPEN UPON SAFETY INJECTION.
23 Nov 73, 7p

Descriptors: (*Surry-2 reactor, *Eccs), Failures, Feedwater, Motors, Performance, Steam generators, Valves.

For abstract, see NSA 29 05, number 12275.

DOCKET-50282-181 PC$3.00/MF$1.45
Northern States Power CO., Minneapolis, Minn. (Usa).
PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2. FINAL REPORT OF VALVE OPERATORS WITH UNSATISFACTORY INSULATION AND SEALS WITHIN CONTAINMENT.
23 Nov 73, 2p DOCKET-50306-143

Descriptors: (*Prairie island-1 reactor, *Eccs), (*Prairie island-2 reactor, Eccs), Containment, Dielectric materials, Electric controllers, Failures, Hydrogen, Loss of coolant, Seals, Thermal insulation, Valves, Ventilation.

For abstract, see NSA 29 05, number 12276.

DOCKET-50282-183 PC$3.00/MF$1.45
Northern States Power CO., Minneapolis, Minn. (Usa).
PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNIT 1. ABNORMAL OCCURRENCE REPORT: INOPERABILITY OF DIESEL GENERATOR FOLLOWING ROUTINE INSULATION RESISTANCE CHECKS.
14 Nov 73, 2p

Descriptors: (*Prairie island-1 reactor, *Electric power), Diesel engines, Failures.

For abstract, see NSA 29 05, number 12277.

DOCKET-50282-185 PC$3.00/MF$1.45
Northern States Power CO., Minneapolis, Minn. (Usa).
PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2. FINAL REPORT ON DISC REPLACEMENT IN MAIN STEAM ISOLATION AND CHECK VALVES.
27 Nov 73, 3p DOCKET-50306-145

Descriptors: (*Prairie island-1 reactor, *Valves), (*Prairie island-2 reactor, Valves), Repair.

For abstract, see NSA 29 05, number 12278.

DOCKET-50282-186 PC$3.00/MF$1.45
Northern States Power CO., Minneapolis, Minn. (Usa).
PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2. FINAL REPORT ON CORROSION PROBLEMS IN REFUELING WATER STORAGE TANKS.
27 Nov 73, 3p DOCKET-50306-146

Descriptors: (*Prairie island-1 reactor, *Reactor fueling), (*Prairie island-2 reactor, Reactor fueling), Corrosion, Storage, Tanks, Water.

For abstract, see NSA 29 05, number 12279.

DOCKET-50285-148 PC$3.00/MF$1.45
Omaha Public Power District, Nebr. (Usa).
FORT CALHOUN STATION, UNIT 1. UNUSUAL EVENT REPORT NO. 73-10: VIBRATION OF MAIN STEAM LINES AND DISCHARGE PIPING FROM THE STEAM DUMP AND BYPASS VALVES.
28 Nov 73, 6p

Descriptors: (*Calhoun-1 reactor, *Secondary coolant circuits), Fluid flow, Mechanical vibrations, Pipes, Turbulence.

For abstract, see NSA 29 05, number 12280.

DOCKET-50289-143 PC$4.25/MF$1.45
Metropolitan Edison CO., Reading, PA. (Usa).
THREE MILE ISLAND NUCLEAR STATION, UNIT 1. REACTOR BUILDING RING GIRDER SURVEILLANCE REPORT.
12 Nov 73, 42p

Descriptors: (*Three mile island-1 reactor, *Containment buildings), Concretes, Cracks, Inspection, Mechanical structures, Supports.

For abstract, see NSA 29 05, number 12281.

DOCKET-50293-210 PC$3.00/MF$1.45
Boston Edison CO., Mass. (Usa).
PILGRIM NUCLEAR POWER STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT NO. AO-73-37: MALFUNCTION OF BARKSDALE MODEL B2T-M12SS PRESSURE SWITCHES.
3 Dec 73, 1p

Descriptors: (*Pilgrim reactor, *Switches), Calibration.

For abstract, see NSA 29 05, number 12282.

DOCKET-50295-213 PC$3.00/MF$1.45
Commonwealth Edison CO., Zion, Ill. (Usa).
ZION NUCLEAR PLANT, UNIT 1. ABNORMAL OCCURRENCE: THE PRESSURIZER HI AND LO SETPOINTS OF 1LC461P WERE FOUND TO BE OUT OF TOLERANCE.
21 Nov 73, 2p

Descriptors: (*Zion-1 reactor, *Pressurizers), Calibration.

For abstract, see NSA 29 05, number 12283.

DOCKET-50295-218 PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill. (Usa).
ZION NUCLEAR PLANT, UNIT 1. ABNORMAL OCCURRENCE: INSTRUMENT LINE FAILURE, CHARGING SYSTEM.
6 Dec 73, 5p

Descriptors: (*Zion-1 reactor, *Reactor instrumentation), Data display systems, Flowmeters, Leaks, Pipelines, Storage, Tanks, Welded joints.

For abstract, see NSA 29 05, number 12284.

DOCKET-50305-132 PC$3.00/MF$1.45
Wisconsin Public Service Corp., Green Bay (Usa).
KEWAUNEE NUCLEAR POWER PLANT. FINAL REPORT ON SAFETY INJECTION PUMP MODIFICATION.
28 Nov 73, 3p

Descriptors: (*Kewaunee reactor, *Pumps).

For abstract, see NSA 29 05, number 12285.

DOCKET-50313-118 PC$3.00/MF$1.45
Arkansas Power and Light CO., Little Rock (Usa).
ARKANSAS NUCLEAR ONE, UNIT 1. SUMMARY REPORT ON REACTOR COOLANT PUMP MOTOR BACKSTOP FAILURE.
19 Nov 73, 6p

Descriptors: (*Arkansas-1 reactor, *Primary coolant circuits), Failures, Pumps.

For abstract, see NSA 29 05, number 12286.

DOCKET-50317-140 PC$3.00/MF$1.45
Baltimore Gas and Electric CO., MD. (Usa).
CALVERT CLIFFS NUCLEAR POWER PLANT, UNITS 1 AND 2. INTERIM REPORT ON ELECTRICAL ARC DAMAGE TO THE REACTOR VESSEL.
26 Nov 73, 2p DOCKET-50318-119

Descriptors: (*Calvert cliffs-2 reactor, *Pressure vessels), Calvert cliffs-1 reactor, Electric arcs, Repair.

For abstract, see NSA 29 05, number 12287.

DOCKET-50317-142 PC$3.00/MF$1.45
Baltimore Gas and Electric CO., MD. (Usa).
CALVERT CLIFFS NUCLEAR POWER PLANT, UNITS 1 AND 2. FINAL DEFICIENCY REPORT: FAILURE OF BATTERY CHARGER SURGE VOLTAGE SUPPRESSORS.
11 Dec 73, 3p DOCKET-50318-121

Descriptors: (*Calvert cliffs-1 reactor, *Electric batteries), (*Calvert cliffs-2 reactor, Electric batteries), Equipment protection devices, Failures.

For abstract, see NSA 29 05, number 12288.

DOCKET-50348-86 PC$3.00/MF$1.45
Alabama Power CO., Birmingham (Usa).
JOSEPH M. FARLEY NUCLEAR PLANT, UNITS 1 AND 2. DESIGN DEFICIENCIES IN THE LOW HEAD SAFETY INJECTION SYSTEM AND THE RIVER WATER SYSTEM.
23 Nov 73, 6p DOCKET-50364-75

Descriptors: (*Farley-1 reactor, *Eccs), (*Farley-2 reactor, Eccs), Containment, Defects, Design, Flow rate, Pipelines, Stress analysis.

For abstract, see NSA 29 05, number 12289.

DOCKET-50413-56 PC$21.25/MF$1.45
Duke Power CO., Charlotte, N.C. (Usa).
CATAWBA NUCLEAR STATION, UNITS 1 AND 2. USAEC FINAL ENVIRONMENTAL STATEMENT.
Dec 73, 385p DOCKET-50414-56

Descriptors: (*Catawba-1 reactor, *Environment), (*Catawba-2 reactor, Environment), Climates, Construction, Cost benefit analysis, Ecology, Geography, Geology, Hydrology, Power.

For abstract, see NSA 29 05, number 12290.

DOCKET-50423-54 PC$36.25/MF$1.45
Millstone Point CO., Hartford, Conn. (Usa).
MILLSTONE NUCLEAR POWER STATION, UNIT 3. LICENSE APPLICATION, ENVIRONMENTAL REPORT, CONSTRUCTION PERMIT STAGE.
7 Feb 73, 684p

Descriptors: (*Millstone-3 reactor, *Environment), Cost benefit analysis, Ecology, Electric power, Geology, Heat transfer, Hydrology, Meteorology, Nonradioactive wastes, Power transmission, Radiation monitoring, Radioactive waste disposal, Reactor accidents, Reactor sites.

For abstract, see NSA 29 05, number 12291.

DOCKET-50440-26 PC$13.75/MF$1.45
Cleveland Electric Illuminating CO., Ohio (Usa).
PERRY NUCLEAR POWER PLANT, UNITS 1 AND 2. USAEC DRAFT ENVIRONMENTAL STATEMENT.
Nov 73, 231p DOCKET-50441-26

Descriptors: (*Perry-1 reactor, *Environment), (*Perry-2 reactor, Environment), Archaeology, Cost benefit analysis, Ecology, Economics, Geology, Ground water, Lake erie, Meteorology, Power, Power transmission, Radiation monitoring, Radioactive wastes, Reactor accidents, Reactor operation, Reactor sites, Sociology, Soils, Surface waters, Thermal pollution.

For abstract, see NSA 29 05, number 12292.

DOCKET-50440-27 PC$3.00/MF$1.45
Cleveland Electric Illuminating CO., Ohio (Usa).
PERRY NUCLEAR POWER PLANT, UNITS 1 AND 2. ICHTHYOPLANKTON SURVEY IN LAKE ERIE.
6 Nov 73, 5p DOCKET-50441-27

Descriptors: (*Perry-1 reactor, *Lake erie), (*Perry-2 reactor, Lake erie), Eggs, Environment, Fishes, Larvae, Plankton, Sampling.

For abstract, see NSA 29 05, number 12293.

DOCKET-50461-1 PC$6.00/MF$1.45
Illinois Power CO., Decatur (Usa).
CLINTON POWER STATION, UNITS 1 AND 2. LICENSE APPLICATION.
26 Oct 73, 77p DOCKET-50462-1

Descriptors: (*Clinton-1 reactor, *Reactor licensing), (*Clinton-2 reactor, Reactor licensing).

For abstract, see NSA 29 05, number 12294.

DOCKET-50461-10 PC$18.75/MF$1.45
Illinois Power CO., Decatur (Usa).
CLINTON POWER STATION, UNITS 1 AND 2. LICENSE APPLICATION, PSAR, VOLUME 8.
26 Oct 73, 332p DOCKET-50462-10

Descriptors: Clinton-1 reactor, Clinton-2 reactor, Documentation, Education, Gaseous wastes, Liquid wastes, Management, Personnel, Radiation monitoring, Radiation protection, Radioactive waste disposal, Reactor operation, Shielding, Solid wastes, Ventilation.

For abstract, see NSA 29 05, number 12303.

DOCKET-50461-11 PC$25.00/MF$1.45
Illinois Power CO., Decatur (Usa).
CLINTON POWER STATION, UNITS 1 AND 2. LICENSE APPLICATION, PSAR, VOLUME 9.
26 Oct 73, 460p DOCKET-50462-11

Descriptors: Clinton-1 reactor, Clinton-2 reactor, Control elements, Coolants, Feedwater, Feedwater heaters, Liquids, Losses, Operation, Pipelines, Pressure gages, Pumps, Reactor accidents, Reactor cores, Reactor start-up, Rod drop accidents, Ruptures, Specifications, Spent fuels, Steam generators, Tanks, Turbines, Valves.

For abstract, see NSA 29 05, number 12304.

DOCKET-50461-12 PC$15.25/MF$1.45
Illinois Power CO., Decatur (Usa).
CLINTON POWER STATION, UNITS 1 AND 2. LICENSE APPLICATION, PSAR, VOLUME 10.
26 Oct 73, 264p DOCKET-50462-12

Descriptors: Clinton-1 reactor, Clinton-2 reactor, Construction, Design, Quality assurance, Reactor operation.

For abstract, see NSA 29 05, number 12305.

DOCKET-50461-13 PC$26.75/MF$1.45
Illinois Power CO., Decatur (Usa).
CLINTON POWER STATION, UNITS 1 AND 2. ENVIRONMENTAL REPORT, VOLUME 1.
26 Oct 73, 492p DOCKET-50462-13

Descriptors: (*Clinton-1 reactor, *Environment), (*Clinton-2 reactor, Environment), Background radiation, Ecology, Geology, Human populations, Hydrology, Meteorology, Power, Reactor sites.

For abstract, see NSA 29 05, number 12306.

DOCKET-50461-14 PC$21.50/MF$1.45
Illinois Power CO., Decatur (Usa).
CLINTON POWER STATION, UNITS 1 AND 2. ENVIRONMENTAL REPORT, VOLUME 2.
26 Oct 73, 386p DOCKET-50462-14

Descriptors: (*Clinton-1 reactor, *Environment), (*Clinton-2 reactor, Environment), Construction, Operation, Radioactive waste disposal, Reactor accidents.

For abstract, see NSA 29 05, number 12307.

DOCKET-50461-15 PC$22.50/MF$1.45
Illinois Power CO., Decatur (Usa).
CLINTON POWER STATION, UNITS 1 AND 2. ENVIRONMENTAL REPORT, VOLUME 3.
26 Oct 73, 408p DOCKET-50462-15

Descriptors: (*Clinton-1 reactor, *Environment), (*Clinton-2 reactor, Environment), Construction, Cost benefit analysis, Economics, Human populations, Reactor operation, Reactor sites, Sociology.

For abstract, see NSA 29 05, number 12308.

DOCKET-50461-16 PC$32.00/MF$1.45
Illinois Power CO., Decatur (Usa).
CLINTON POWER STATION, UNITS 1 AND 2. ENVIRONMENTAL REPORT, VOLUME 4.
26 Oct 73, 599p DOCKET-50462-16

Descriptors: (*Clinton-1 reactor, *Environment), (*Clinton-2 reactor, Environment), Cost benefit analysis, L codes, Lakes, Noise, Occupations, Plankton, Power transmission, Radiation doses, Reactor cooling systems, Reactor noise, Reactor sites, Water, Wind.

For abstract, see NSA 29 05, number 12309.

DOCKET-50461-2 PC$7.00/MF$1.45
Illinois Power CO., Decatur (Usa).
CLINTON POWER STATION, UNITS 1 AND 2. ANTITRUST REVIEW INFORMATION REQUESTED BY THE ATTORNEY GENERAL.
26 Oct 73, 100p DOCKET-50462-2

Descriptors: Clinton-1 reactor, Clinton-2 reactor, Reactor licensing.

For abstract, see NSA 29 05, number 12295.

DOCKET-50461-20 PC$9.25/MF$1.45
Illinois Power CO., Decatur (Usa).
CLINTON POWER STATION, UNITS 1 AND 2. CONSTRUCTION PERMIT STAGE, ENVIRONMENTAL REPORT, SUPPLEMENT 1.
30 Oct 73, 145p DOCKET-50462-20

Descriptors: (*Clinton-1 reactor, *Environment), (*Clinton-2 reactor, Environment), Cost, Fishes, Floods, Flow rate, Human populations, Lakes, Management, Meteorology, Power, Quality control, Reactor sites, Sampling, Thermal pollution.

For abstract, see NSA 29 05, number 12310.

DOCKET-50461-3 PC$27.50/MF$1.45
Illinois Power CO., Decatur (Usa).
CLINTON POWER STATION, UNITS 1 AND 2. LICENSE APPLICATION, PSAR, VOLUME 1.
26 Oct 73, 506p DOCKET-50462-3

Descriptors: Clinton-1 reactor, Clinton-2 reactor, Geography, Human populations, Industrial plants, Reactor sites, Transport.

For abstract, see NSA 29 05, number 12296.

DOCKET-50461-4 PC$26.75/MF$1.45
Illinois Power CO., Decatur (Usa).
CLINTON POWER STATION, UNITS 1 AND 2. LICENSE APPLICATION, PSAR, VOLUME 2.
26 Oct 73, 494p DOCKET-50462-4

Descriptors: Clinton-1 reactor, Clinton-2 reactor, Geology, Hydrology, Meteorology, Reactor sites, Seismology.

For abstract, see NSA 29 05, number 12297.

DOCKET-50461-5 PC$24.75/MF$1.45
Illinois Power CO., Decatur (Usa).
CLINTON POWER STATION, UNITS 1 AND 2. LICENSE APPLICATION, PSAR, VOLUME 3.
26 Oct 73, 452p DOCKET-50462-5

Descriptors: Clinton-1 reactor, Clinton-2 reactor, Computer codes, Design, Electrical equipment, Floods, Mechanical structures, Pipes, Quality control, Reactor components, Ruptures, Seismic effects, Standards, Wind.

For abstract, see NSA 29 05, number 12298.

DOCKET-50461-6 PC$24.50/MF$1.45
Illinois Power CO., Decatur (Usa).
CLINTON POWER STATION, UNITS 1 AND 2. LICENSE APPLICATION, PSAR, VOLUME 4.
26 Oct 73, 450p DOCKET-50462-6

Descriptors: Clinton-1 reactor, Clinton-2 reactor, Control rod drives, Hydraulics, Pressure vessels, Reactor cooling systems.

For abstract, see NSA 29 05, number 12299.

DOCKET-50461-7 PC$23.00/MF$1.45
Illinois Power CO., Decatur (Usa).
CLINTON POWER STATION, UNITS 1 AND 2. LICENSE APPLICATION, PSAR, VOLUME 5.
26 Oct 73, 417p DOCKET-50462-7

Descriptors: Clinton-1 reactor, Clinton-2 reactor, Containment, Control rod drives, Core spray systems, Eccs, Reactor control systems, Reactor instrumentation, Scram, Valves.

For abstract, see NSA 29 05, number 12300.

DOCKET-50461-8 PC$28.00/MF$1.45
Illinois Power CO., Decatur (Usa).
CLINTON POWER STATION, UNITS 1 AND 2. LICENSE APPLICATION, PSAR, VOLUME 6.
26 Oct 73, 517p DOCKET-50462-8

Descriptors: Clinton-1 reactor, Clinton-2 reactor, Data display systems, Electric power, Power density, Reactor control systems, Reactor instrumentation, Reactor safety, Reactor shutdown.

For abstract, see NSA 29 05, number 12301.

DOCKET-50461-9 PC$29.75/MF$1.45
Illinois Power CO., Decatur (Usa).
CLINTON POWER STATION, UNITS 1 AND 2. LICENSE APPLICATION, PSAR, VOLUME 7.
26 Oct 73, 553p DOCKET-50462-9

Descriptors: Air conditioning, Clinton-1 reactor, Clinton-2 reactor, Electric power, Fuel elements, Heating, Remote handling, Storage, Turbogenerators, Ventilation.

For abstract, see NSA 29 05, number 12302.

DOCKET-50463-12 PC$15.00/MF$1.45
Philadelphia Electric CO., PA. (Usa).
FULTON GENERATING STATION, UNITS 1 AND 2. LICENSE APPLICATION, PSAR, VOLUME 7.
1973, 259p DOCKET-50464-12

Descriptors: Electric power, Fulton-1 reactor, Fulton-2 reactor, Mechanical structures, Radiation protection, Radioactive waste disposal, Reactor components, Reactor control systems, Reactor cooling systems, Reactor instrumentation, Specifications.

For abstract, see NSA 29 05, number 12311.

DOCKET-50466-1 PC$25.25/MF$1.45
Houston Lighting and Power CO., Tex. (Usa).
ALLENS CREEK NUCLEAR GENERATING STATION, UNITS 1 AND 2. LICENSE APPLICATION, PSAR, VOLUME 1.
5 Dec 73, 465p DOCKET-50467-1

Descriptors: Allens creek-1 reactor, Allens creek-2 reactor, Cooling, Geography, Human populations, Industrial plants, Lakes, Meteorology, Reactor sites, Transport.

For abstract, see NSA 29 05, number 12312.

DOCKET-50466-10 PC$27.00/MF$1.45
Houston Lighting and Power CO., Tex. (Usa).
ALLENS CREEK NUCLEAR GENERATING STATION, UNITS 1 AND 2. LICENSE APPLICATION, PSAR, VOLUME 10.
5 Dec 73, 500p DOCKET-50467-10

Descriptors: Allens creek-1 reactor, Allens creek-2 reactor, Documentation, Education, Personnel, Radiation protection, Reactor accidents, Reactor cooling systems, Reactor operation, Shielding, Testing, Ventilation.

For abstract, see NSA 29 05, number 12319.

DOCKET-50466-11 PC$29.50/MF$1.45
Houston Lighting and Power CO., Tex. (Usa).
ALLENS CREEK NUCLEAR GENERATING STATION, UNITS 1 AND 2. LICENSE APPLICATION, PSAR, VOLUME 11.
5 Dec 73, 548p DOCKET-50467-11

Descriptors: Allens creek-1 reactor, Allens creek-2 reactor, Construction, Containment, Control, Design, Fuel elements, Management, Pressure vessels, Quality assurance, Specifications, Storage.

For abstract, see NSA 29 05, number 12320.

DOCKET-50466-12 PC$5.75/MF$1.45
Houston Lighting and Power CO., Tex. (Usa).
ALLENS CREEK NUCLEAR GENERATING STATION, UNITS 1 AND 2. LICENSE APPLICATION.
5 Dec 73, 74p DOCKET-50467-12

Descriptors: (*Allens creek-1 reactor, *Reactor licensing), (*Allens creek-2 reactor, Reactor licensing).

For abstract, see NSA 29 05, number 12321.

DOCKET-50466-13 PC$3.00/MF$1.45
Houston Lighting and Power CO., Tex. (Usa).
ALLENS CREEK NUCLEAR GENERATING STATION, UNITS 1 AND 2. RO INSPECTION REPORT NO. P-493/73-02.
5 Dec 73, 14p DOCKET-50467-13

Descriptors: Allens creek-1 reactor, Allens creek-2 reactor, Documentation, Inspection, Quality assurance, Reactor licensing.

For abstract, see NSA 29 05, number 12322.

DOCKET-50466-14 PC$6.00/MF$1.45
Houston Lighting and Power CO., Tex. (Usa).
ALLENS CREEK NUCLEAR GENERATING STATION, UNITS 1 AND 2. ANTITRUST REVIEW INFORMATION REQUESTED BY THE ATTORNEY GENERAL.
5 Dec 73, 79p DOCKET-50467-14

Descriptors: Allens creek-1 reactor, Allens creek-2 reactor, Reactor licensing.

For abstract, see NSA 29 05, number 12323.

DOCKET-50466-15 PC$31.75/MF$1.45
Houston Lighting and Power CO., Tex. (Usa).
ALLENS CREEK NUCLEAR GENERATING STATION, UNITS 1 AND 2. ENVIRONMENTAL REPORT, VOLUME 1.
5 Dec 73, 594p DOCKET-50467-15

Descriptors: (*Allens creek-1 reactor, *Environment), (*Allens creek-2 reactor, Environment), Climates, Construction, Ecology, Electric power, Geography, Geology, Hydrology, Nonradioactive waste disposal, Radioactive waste disposal, Reactor operation, Reactor sites, Water.

For abstract, see NSA 29 05, number 12324.

DOCKET-50466-16 PC$20.25/MF$1.45
Houston Lighting and Power CO., Tex. (Usa).
ALLENS CREEK NUCLEAR GENERATING STATION, UNITS 1 AND 2. ENVIRONMENTAL REPORT, VOLUME 2.
5 Dec 73, 361p DOCKET-50467-16

Descriptors: (*Allens creek-1 reactor, *Environment), (*Allens creek-2 reactor, Environment), Aquatic ecosystems, Economics, Heat transfer, Radiation monitoring, Reactor accidents, Sociology, Terrestrial ecosystems, Thermal pollution.

For abstract, see NSA 29 05, number 12325.

DOCKET-50466-17 PC$28.75/MF$1.45
Houston Lighting and Power CO., Tex. (Usa).
ALLENS CREEK NUCLEAR GENERATING STATION, UNITS 1 AND 2. ENVIRONMENTAL REPORT, VOLUME 3.
5 Dec 73, 534p DOCKET-50467-17

Descriptors: (*Allens creek-1 reactor, *Environment), (*Allens creek-2 reactor, Environment), Archaeology, Cost benefit analysis, Radiation monitoring.

For abstract, see NSA 29 05, number 12326.

DOCKET-50466-2 PC$18.00/MF$1.45
Houston Lighting and Power CO., Tex. (Usa).
ALLENS CREEK NUCLEAR GENERATING STATION, UNITS 1 AND 2. LICENSE APPLICATION, PSAR, VOLUME 2.
5 Dec 73, 318p DOCKET-50467-2

Descriptors: Allens creek-1 reactor, Allens creek-2 reactor, Dams, Environment, Failures, Floods, Ice, Lakes, Radioactive waste disposal, Reactor sites, Seismic effects, Tsunamis.

For abstract, see NSA 29 05, number 12313.

DOCKET-50466-4 PC$22.25/MF$1.45
Houston Lighting and Power CO., Tex. (Usa).
ALLENS CREEK NUCLEAR GENERATING STATION, UNITS 1 AND 2. LICENSE APPLICATION, PSAR, VOLUME 4.
5 Dec 73, 401p DOCKET-50467-4

Descriptors: Allens creek-1 reactor, Allens creek-2 reactor, Design, Geology, Mechanical structures, Reactor components, Reactor sites, Seismology, Wind.

For abstract, see NSA 29 05, number 12314.

DOCKET-50466-5 PC$30.70/MF$1.45
Houston Lighting and Power CO., Tex. (Usa).
ALLENS CREEK NUCLEAR GENERATING STATION, UNITS 1 AND 2. LICENSE APPLICATION, PSAR, VOLUME 5.
5 Dec 73, 568p DOCKET-50467-5

Descriptors: Allens creek-1 reactor, Allens creek-2 reactor, Control rod drives, Design, Electrical equipment, Environment, Hydraulics, Mechanical structures, Pipelines, Reactor components, Reactor instrumentation, Ruptures, Seismic effects, Supports.

For abstract, see NSA 29 05, number 12315.

DOCKET-50466-6 PC$26.75/MF$1.45
Houston Lighting and Power CO., Tex. (Usa).
ALLENS CREEK NUCLEAR GENERATING STATION, UNITS 1 AND 2. LICENSE APPLICATION, PSAR, VOLUME 6.
5 Dec 73, 595p DOCKET-50467-6

Descriptors: Allens creek-1 reactor, Allens creek-2 reactor, Containment, Eccs, Feedwater, Hydraulics, Pressure vessels, Pumps, Reactor control systems, Reactor cooling systems, Reactor cores, Reactor instrumentation, Valves.

For abstract, see NSA 29 05, number 12316.

DOCKET-50466-7 PC$21.75/MF$1.45
Houston Lighting and Power CO., Tex. (Usa).
ALLENS CREEK NUCLEAR GENERATING STATION, UNITS 1 AND 2. LICENSE APPLICATION, PSAR, VOLUME 7.
5 Dec 73, 398p DOCKET-50467-7

Descriptors: Allens creek-1 reactor, Allens creek-2 reactor, Display devices, Reactor control systems, Reactor instrumentation, Reactor shutdown.

For abstract, see NSA 29 05, number 12317.

DOCKET-50466-8 PC$23.25/MF$1.45
Houston Lighting and Power CO., Tex. (Usa).
ALLENS CREEK NUCLEAR GENERATING STATION, UNITS 1 AND 2. LICENSE APPLICATION, PSAR, VOLUME 8.
5 Dec 73, 425p DOCKET-50467-8

Descriptors: Allens creek-1 reactor, Allens creek-2 reactor, Computers, Electric power, Feedwater, Fuel elements, Pressure dependence, Pressure vessels, Radiation monitoring, Reactor control systems, Reactor fueling, Reactor instrumentation, Remote handling, Storage, Turbines.

For abstract, see NSA 29 05, number 12318.

DOCKET-50471-1 PC$30.75/MF$1.45
Boston Edison CO., Mass. (Usa).
PILGRIM NUCLEAR POWER STATION, UNIT 2. LICENSE APPLICATION, VOLUME 1.
21 Dec 73, 571p

Descriptors: (*Pilgrim-2 reactor, *Reactor licensing), Cost, Nuclear insurance.

For abstract, see NSA 29 05, number 12327.

DOCKET-50471-10 PC$24.50/MF$1.45
Boston Edison CO., Mass. (Usa).
PILGRIM NUCLEAR POWER STATION, UNITS 2 AND 3. LICENSE APPLICATION, PSAR, VOLUME 7.
1973, 449p DOCKET-50472-9

Descriptors: Education, Gaseous wastes, Industrial plants, Liquid wastes, Pilgrim-2 reactor, Pilgrim-3 reactor, Radiation monitoring, Radiation protection, Radioactive waste disposal, Reactor operation, Security, Shielding, Solid wastes, Testing, Ventilation.

For abstract, see NSA 29 05, number 12336.

DOCKET-50471-11 PC$35.75/MF$1.45
Boston Edison CO., Mass. (Usa).
PILGRIM NUCLEAR POWER STATION, UNITS 2 AND 3. LICENSE APPLICATION, PSAR, VOLUME 8.
1973, 672p DOCKET-50472-10

Descriptors: Calibration, Inspection, Pilgrim-2 reactor, Pilgrim-3 reactor, Quality assurance, Radioactivity, Reactor accidents, Specifications, Stack disposal.

For abstract, see NSA 29 05, number 12337.

DOCKET-50471-2 PC$21.50/MF$1.45
Boston Edison CO., Mass. (Usa).
PILGRIM NUCLEAR POWER STATION, UNIT 2. ANTITRUST REVIEW INFORMATION REQUESTED BY THE ATTORNEY GENERAL, VOLUME 1.
21 Dec 73, 386p

Descriptors: Pilgrim-2 reactor, Reactor licensing.

For abstract, see NSA 29 05, number 12328.

DOCKET-50471-3 PC$18.50/MF$1.45
Boston Edison CO., Mass. (Usa).
PILGRIM NUCLEAR POWER STATION, UNIT 2. ANTITRUST REVIEW INFORMATION REQUESTED BY THE ATTORNEY GENERAL, VOLUME 2.
21 Dec 73, 326p

Descriptors: Pilgrim-2 reactor, Reactor licensing.

For abstract, see NSA 29 05, number 12329.

DOCKET-50471-4 PC$27.75/MF$1.45
Boston Edison CO., Mass. (Usa).

PILGRIM NUCLEAR POWER STATION, UNITS 2 AND 3. LICENSE APPLICATION, PSAR, VOLUME 1.
20 Dec 73, 512p DOCKET-50472-3

Descriptors: Design, Geography, Geology, Human populations, Hydrology, Industrial plants, Pilgrim-2 reactor, Pilgrim-3 reactor, Reactor sites, Seismology, Transport.

For abstract, see NSA 29 05, number 12330.

DOCKET-50471-5 PC$22.50/MF$1.45
Boston Edison CO., Mass. (Usa).
PILGRIM NUCLEAR POWER STATION, UNITS 2 AND 3. LICENSE APPLICATION, PSAR, VOLUME 2.
1973, 407p DOCKET-50472-4

Descriptors: Pilgrim-2 reactor, Pilgrim-3 reactor, Reactor sites, Seismology, Soils.

For abstract, see NSA 29 05, number 12331.

DOCKET-50471-6 PC$26.00/MF$1.45
Boston Edison CO., Mass. (Usa).
PILGRIM NUCLEAR POWER STATION, UNITS 2 AND 3. LICENSE APPLICATION, PSAR, VOLUME 3.
1973, 477p DOCKET-50472-5

Descriptors: Design, Environment, Floods, Hydraulics, Mechanical structures, Pilgrim-2 reactor, Pilgrim-3 reactor, Pipelines, Reactor components, Ruptures, Seismic effects, Wind.

For abstract, see NSA 29 05, number 12332.

DOCKET-50471-7 PC$26.75/MF$1.45
Boston Edison CO., Mass. (Usa).
PILGRIM NUCLEAR POWER STATION, UNITS 2 AND 3. LICENSE APPLICATION, PSAR, VOLUME 4.
2 Jan 74, 491p DOCKET-50472-6

Descriptors: Containment, Flowmeters, Hydraulics, Pilgrim-2 reactor, Pilgrim-3 reactor, Pipelines, Pressure vessels, Pumps, Reactor cooling systems, Ruptures, Steam generators.

For abstract, see NSA 29 05, number 12333.

DOCKET-50471-8 PC$26.00/MF$1.45
Boston Edison CO., Mass. (Usa).
PILGRIM NUCLEAR POWER STATION, UNITS 2 AND 3. LICENSE APPLICATION, PSAR, VOLUME 5.
1973, 480p DOCKET-50472-7

Descriptors: Data display systems, Electric power, Pilgrim-2 reactor, Pilgrim-3 reactor, Reactor control systems, Reactor instrumentation, Reactor protection systems, Reactor safety, Reactor shutdown, Scram.

For abstract, see NSA 29 05, number 12334.

DOCKET-50471-9 PC$19.75/MF$1.45
Boston Edison CO., Mass. (Usa).
PILGRIM NUCLEAR POWER STATION, UNITS 2 AND 3. LICENSE APPLICATION, PSAR, VOLUME 6.
1973, 351p DOCKET-50472-8

Descriptors: Blowdown, Bypasses, Diesel engines, Fuel elements, Pilgrim-2 reactor, Pilgrim-3 reactor, Remote handling, Seals, Steam condensers, Steam generators, Storage, Turbines, Turbogenerators.

For abstract, see NSA 29 05, number 12335.

DOCKET-50472-1 PC$5.25/MF$1.45
Boston Edison CO., Mass. (Usa).
PILGRIM NUCLEAR POWER STATION, UNIT 3. LICENSE APPLICATION.
21 Dec 73, 65p

Descriptors: (*Pilgrim-3 reactor, *Reactor licensing), Construction, Cost.

For abstract, see NSA 29 05, number 12338.

DOCKET-50472-2 PC$10.75/MF$1.45
Boston Edison CO., Mass. (Usa).
PILGRIM NUCLEAR POWER STATION, UNIT 3. ANTITRUST REVIEW INFORMATION REQUESTED BY THE ATTORNEY GENERAL.
21 Dec 73, 171p

Descriptors: Pilgrim-3 reactor, Reactor licensing.

For abstract, see NSA 29 05, number 12339.

FIND-50412 PC$4.00/MF$1.45
Usaec Technical Information Center, Oak Ridge, Tenn.
FIND: BEAVER VALLEY POWER STATION, UNIT 2. ITEMS 1-37.
E. P. Carter. Nov 73, 22p

Descriptors: (*Beaver valley-2 reactor, *Reactor safety), Indexes, Legal aspects, Reactor licensing.

For abstract, see NSA 29 05, number 12349.

JUL-932-RG PC$6.75/MF$1.45
INFLUENCE OF THE UPPER CAVITY ON NEUTRON PHYSICS OF THE PEBBLE-BED REACTOR.
V. Maly. Mar 73, 94p
In German. U.S. Sales Only.

Descriptors: (*Pebble bed reactors, *Reactor kinetics), Cavities, Neutron flux, Neutron transport, Power density, Process heat reactors, Reactor cores, Voids.

For abstract, see NSA 29 05, number 11796.

NEDO-10183 PC$17.00/MF$1.45
General Electric CO., San Jose, Calif. (Usa). Atomic Power Equipment Dept.
CORE STANDBY COOLING SYSTEMS FOR THE GENERAL ELECTRIC 1969 BWR STANDARD PLANTS.
May 70, 300p

Descriptors: (*Bwr type reactors, Eccs), (*Eccs, *Design), Analytical solution, Configuration, Heat transfer, Hydraulics, Mathematical models, Performance, Reactor accidents.

For abstract, see NSA 29 05, number 11755.

RCN-190 PC$6.00/MF$1.45
Stichting Reactor Centrum Nederland, Petten.
FAST REACTOR PROGRAMME. SECOND QUARTER 1973 PROGRESS REPORT.
E. K. Hoekstra. Aug 73, 79p
U.S. Sales Only.

Descriptors: (*Stek reactor, *Reactor kinetics), (*Fuel pins, *Failures), (*Uranium carbides, *Thermodynamic properties), (*Uranium nitrides, Thermodynamic properties), Neutron spectra, Reactivity worths, Reactor operation, Research programs, Testing, Loss of coolant, Physical radiation effects, Stainless steels.

For abstract, see NSA 29 05, number 11915.

RCN-195 PC$5.00/MF$1.45
Stichting Reactor Centrum Nederland, Petten.
INVESTIGATION ON TEMPERATURE NOISE IN LIQUID SODIUM FLOWING THROUGH AN ELECTRICALLY HEATED 4-PIN BUNDLE.
C. Mika, K. H. Raes, E. Tuerkcan, and J. E. de Vries. Jun 73, 56p
U.S. Sales Only.

Descriptors: (*Lmfbr type reactors, Fuel assemblies), (*Fuel assemblies, *Temperature noise), Fbr type reactors, Flow rate, Fuel pins, Heat transfer, Heaters, Liquid flow, Mockup, Simulation, Sodium, Testing.

For abstract, see NSA 29 05, number 11877.

RCN-197 PC$7.25/MF$1.45
Stichting Reactor Centrum Nederland, Petten.
POST IRRADIATION EXAMINATION OF FAST REACTOR FUEL PINS IRRADIATED IN A SODIUM ENVIRONMENT UP TO ABOUT 55 MWD/KG UO SUB 2 .
H. Kwast. Nov 73, 103p
U.S. Sales Only.

Descriptors: (*Fast reactors, Fuel pins), (*Fuel pins, *Physical radiation effects), Burnup, Failures, Fission products, Fuel-cladding interactions, Irradiation capsules, Losses, Performance, Snr reactor, Sodium, Stainless steels, Testing, Uranium dioxide.

For abstract, see NSA 29 05, number 11878.

WASH-1284 PC$9.00/MF$1.45
Usaec, Washington, D.C.
GUIDANCE ON QUALITY ASSURANCE REQUIREMENTS DURING THE OPERATIONS PHASE OF NUCLEAR POWER PLANTS.
26 Oct 73, 140p

Descriptors: (*Nuclear power plants, Quality assurance), (*Quality assurance, *Regulations), Reactor operation, Standards, Us aec.

For abstract, see NSA 29 05, number 12351.

WCAP-7820(Suppl.2) PC$4.50/MF$1.45
Westinghouse Electric Corp., Pittsburgh, PA. (Usa).
ELECTRIC HYDROGEN RECOMBINER FOR PWR CONTAINMENTS: EQUIPMENT QUALIFICATION REPORT.
J. F. Wilson. Oct 73, 48p

Descriptors: (*Pwr type reactors, Recombiners), (*Recombiners, *Performance testing), Configuration, Containment systems, Reactor accidents.

For abstract, see NSA 29 05, number 11777.

18F. Radiation Shielding and Protection

CEA-CONF-2319 PC$3.75/MF$1.45
ANTINEA CHAIN: SEALED AND SHIELDED CHAIN FOR THE FABRICATION OF METALLIC EXP 238 PU OF HIGH PURITY.
J. C. Baudoin, F. Drieu, D. Damien, G. Faudot, and G. Lefort. 19p CONF-720649-6
In French. U.S. Sales Only.

Descriptors: (*Plutonium 238, Radiation sources), (*Hot cells, *Design), (*Radiation sources, *Fabrication), Gloveboxes, Impurities.

For abstract, see NSA 29 05, number 10788.

GKSS-73-E-17 PC$4.75/MF$1.45
Gesellschaft fuer Kernenergieverwertung in Schiffbau und Schiffahrt M.B.H., Geesthacht-Tesperhude (F.R. Germany).
LGH-G: A PROGRAM TO CALCULATE GAMMA -RADIATION THROUGH PARTLY SHIELDED OPENINGS.
R. Fiebig, and P. Rybaczok. 1973, 54p
In German. U.S. Sales Only.

Descriptors: (*Shielding, *Photon transport), (*Gamma transport theory, Computer codes),

(*Computer codes, *L codes), Angular distribution, Attenuation, Boundary conditions, Buildup, Gamma radiation, Integrals, Layers, Numerical solution, Quadrupoles, Spatial distribution, Transmission.

For abstract, see NSA 29 05, number 11714.

PATENT-3 754 141 Not available NTIS
Atomic Energy Commission, Washington, D.C.
SHIPPING AND STORAGE CONTAINER FOR HIGH POWER DENSITY RADIOACTIVE MATERIALS.
Patent,
Robert G. Leebl, Robert L. Sandvig, and Edward Vejvoda. Filed 12 Jul 72, patented 21 Aug 73, 5p
PAT-APPL-270 885
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Radioactive materials, *Radioactive shielding, *Patents, Shipping containers, Storage.
Identifiers: PAT-CL-250-507.

The patent concerns a shipping and storage container for radioactive material, particularly high thermal producing fissle material. It includes a cylindrical inner metal container for retaining the radioactive material, an alpha contamination barrier of polyvinyl chloride surrounding said inner container, a cylindrical outer metal container enclosing said inner container and barrier with inner surfaces spaced from the inner container walls and from said barrier, and finely divided heat absorbing and transferring or conducting magnesium oxide filling the space intermediate said barrier and the inner surfaces of the outer metal container.

SSI-1973-23 PC$3.00/MF$1.45
Statens Straalskyddsinstitut, Stockholm (Sweden).
ESTABLISHMENT OF STANDARDS AND WORKING LIMITS FOR RADIOACTIVE CONTAMINANTS.
B. Lindell. Nov 73, 8p SM-180/77
U.S. Sales Only.

Descriptors: (*Radiation protection, *Safety standards), (*Maximum permissible dose, *Recommendations), (*Human populations, Radiation protection), Environment, Icrp, Radiation doses, Radioactivity, Standards.

For abstract, see NSA 29 05, number 11710.

18G. Radioactive Wastes and Fission Products

ARH-R-43(Rev.2) PC$5.00/MF$1.45
Atlantic Richfield Hanford CO., Richland, Wash. (Usa).
MANAGEMENT OF RADIOACTIVE WASTES STORED IN UNDERGROUND TANKS AT HANFORD.
R. W. Harvey. Apr 70, 56p

Descriptors: (*Radioactive waste disposal, *Waste storage), Hapo, Tanks, Underground disposal.

For abstract, see NSA 29 05, number 10777.

ARH-2214 PC$3.00/MF$1.45
Atlantic Richfield Hanford CO., Richland, Wash. (Usa).
ANTICIPATED EFFECT OF DISCHARGING 242-S EVAPORATOR COOLING WATER TO THE GROUND.
M. D. Veatch. 17 Sep 71, 15p

Descriptors: (*Hapo, *Hydrology), (*Coolants, *Waste disposal), Ground water, Levels, Liquid wastes, Variations.

For abstract, see NSA 29 05, number 10156.

ARH-231(Del.) PC$15.00/MF$1.45
Atlantic Richfield Hanford CO., Richland, Wash. (Usa).
HANFORD LOW LEVEL WASTE MANAGEMENT REEVALUATION STUDY.
R. J. Sloat. 29 Dec 67, 260p
Contract AT(45-1)-2130

Descriptors: (*Radioactive waste disposal, *Planning), Hapo, Radioactive waste processing.

For abstract, see NSA 29 05, number 10772.

ARH-2384 PC$3.00/MF$1.45
Atlantic Richfield Hanford CO., Richland, Wash. (Usa).
DESIGN CRITERIA: DATA ACQUISITION SYSTEM FOR WASTE TANK LIQUID LEVEL GAUGES AND SX TANK FARM THERMOCOUPLES.
G. E. Martin, and R. G. Oliver. 17 Feb 72, 12p
Contract AT(45-1)-2130

Descriptors: (*Radioactive wastes, *Waste storage), (*Level indicators, *Data acquisition systems), (*Thermocouples, Data acquisition systems), (*Tanks, Waste storage), Design, Ibm computers, Liquid wastes, Specifications.

For abstract, see NSA 29 05, number 10773.

ARH-2419 PC$3.25/MF$1.45
Atlantic Richfield Hanford CO., Richland, Wash. (Usa).
RADIOACTIVE EFFLUENT REDUCTION FROM 200 AREA FACILITIES, PHASE II.
G. L. Hanson. 24 Mar 72, 25p

Descriptors: (*Radioactive waste disposal, *Underground disposal), Hapo, Liquid wastes, Radioactive waste processing.

For abstract, see NSA 29 05, number 10774.

ARH-2757(Pt.3) PC$9.25/MF$1.45
Atlantic Richfield Hanford CO., Richland, Wash. (Usa).
RADIOACTIVE LIQUID WASTES DISCHARGED TO GROUND IN THE 200 AREAS DURING 1972.
J. D. Anderson. 9 Apr 73, 141p

Descriptors: (*Radioactive waste disposal, *Underground disposal), Hapo, Liquid wastes.

For abstract, see NSA 29 05, number 10775.

ARH-2874 PC$4.00/MF$1.45
Atlantic Richfield Hanford CO., Richland, Wash. (Usa).
241-T-106 TANK LEAK INVESTIGATION.
Nov 73, 48p
Contract AT(45-1)-2130

Descriptors: (*Radioactive waste disposal, *Waste storage), (*Tanks, *Leaks), Hapo, Radiation monitoring.

For abstract, see NSA 29 05, number 10776.

BNWL-CC-2617 PC$3.50/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
FAILURE OF 307 BASIN TRANSFER LINE AND RESULTANT GROUND CONTAMINATION.
D. H. Denham. 1970, 26p
Contract AT(45-1)-1830

Descriptors: (*Radioactive waste disposal, *Waste storage), Contamination, Leaks, Tanks.

For abstract, see NSA 29 05, number 10778.

BNWL-CC-313 PC$3.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
REACTION OF HIGH SALT AQUEOUS PLUS ORGANIC WASTE WITH SOIL. INTERIM REPORT.
K. C. Knoll. 8p
Contract AT(45-1)-1830

Descriptors: (*Radioactive waste processing, *Liquid wastes), (*Soils, *Sorptive properties), (*Plutonium, *Adsorption), (*Americium, Adsorption), Chemical reactions, Organic compounds.

For abstract, see NSA 29 05, number 09979.

BNWL-1788 PC$5.45/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
RESEARCH AND DEVELOPMENT ACTIVITIES, WASTE FIXATION PROGRAM. QUARTERLY PROGRESS REPORT, JULY--SEPTEMBER 1973.
A. M. Platt. Oct 73, 53p
Contract AT(45-1)-1830

Descriptors: (*Radioactive waste processing, *Solidification), (*Waste storage, *Containers), Boron silicates, Buildup, Ceramics, Glass, Helium, Radioactive wastes, Research programs, Reviews, Stress analysis, Welded joints.

For abstract, see NSA 29 05, number 09978.

CEA-CONF-2234 PC$3.00/MF$1.45
RADIOPROTECTION AND MANAGEMENT OF RADIOACTIVE WASTES.
L. Fitoussi. 14p CONF-721122-3
In French. U.S. Sales Only.

Descriptors: (*Radioactive waste disposal, *Radiation protection), Radiation hazards, Reviews.

For abstract, see NSA 29 05, number 10779.

CEA-CONF-2306 PC$4.00/MF$1.45
TECHNIQUES FOR SAMPLING AND ANALYSIS FOR THE IN-PILE STUDY OF THE MIGRATION OF FISSION GASES IN CERAMIC FUELS.
P. Chenebault. 15 Mar 72, 22p CONF-720566-2
In French. U.S. Sales Only.

Descriptors: (*Fission products, *Gas analysis), Chromatography, Diffusion, Fuel pins, Gamma spectroscopy, Gases, Half-life, Heating, High temperature, Measuring methods, Plutonium oxides, Radioactivity, Sampling, Uranium dioxide, Very high temperature.

For abstract, see NSA 29 05, number 10581.

CEA-CONF-2417 PC$3.75/MF$1.45
Cea Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France).
DETAILS OF THE DISPOSAL OF RADIOACTIVE WASTES CONTAMINATED WITH EXP 239 PU.
R. Conche, R. Philippin, L. Hayet, and G. Rouffet. 1973, 32p CONF-730667-3
In French. U.S. Sales Only.

Descriptors: (*Plutonium 239, *Radioactive waste disposal), (*Radioactive waste processing, *Alpha sources), Radioactive wastes, Waste storage, Waste transportation.

For abstract, see NSA 29 05, number 09980.

NP-19911 PC$5.50/MF$1.45
Commission of the European Communities, Luxembourg. Directorate for Health and Safety.

APPLICATION OF ARTICLE 37 OF THE EURATOM TREATY. SURVEY OF ACTIVITIES: EXPERIENCE GAINED, 1959--1972.
1972, 70p
U.S. Sales Only.

Descriptors: (*Radioactive waste disposal, *Treaties), Euratom, International agreements.

For abstract, see NSA 29 05, number 10782.

ORNL-4792 PC$5.45/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
USE OF ION EXCHANGE FOR THE TREATMENT OF LIQUIDS IN NUCLEAR POWER PLANTS.
K. H. Lin. Dec 73, 108p
Contract W-7405-eng-26

Descriptors: (*Radioactive waste processing, *Ion exchange), Coolants, Decontamination, Liquid wastes, Nuclear power plants, Radioactive wastes, Resins.

For abstract, see NSA 29 05, number 09982.

PB-228 858/7GA PC$7.50/MF$1.45
Cornell Univ., Ithaca, N.Y. Cornell Energy Project.
REVIEW AND ANALYSIS OF RADWASTE MANAGEMENT FOR LIGHT WATER REACTORS,
J. A. Franco, and K. B. Cady. Aug 71, 90p Paper-71-10 NSF-RA/N-74-010
Grant NSF-GI-29903
Report on National Energy Needs and Environmental Quality.

Descriptors: *Radioactive wastes, *Boiling water reactors, *Pressurized water reactors, Management planning, Performance evaluation, Water pollution control, Radioactive waste processing, Trends.

The performance of present generation boiling water reactors and pressurized water reactors is analyzed in terms of radwaste system design and management and effluent release. Present methods of low level waste treatment are 'dilution and dispersal'. Fuel element integrity is the single most important variable in minimizing reactor effluents. The most significant boiling water reactor effluents are the relatively large quantities of short-lived noble gas isotopes. Pressurized water reactor gaseous wastes are composed mainly of longer-lived noble gas isotopes. Pressurized water reactor liquid waste contains tritium. Releases from these can be reduced significantly by a shift to a 'concentrate and contain' method for low level waste streams and the application of new technologies. Liquid waste reductions can be achieved by increased purification and recycling of plant water. The suggestion is made that future radiation release standards contain man-rem population dose allocations for each plant, as well as the single person exposure limits.

UCRL-75243 PC$3.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
CONSIDERATIONS IN SITING LONG-TERM RADIOACTIVE NOBLE GAS STORAGE FACILITIES.
J. J. Cohen, and K. R. Peterson. 4 Dec 73, 15p
CONF-730915-10

Descriptors: (*Krypton 85, *Waste storage), (*Fuel reprocessing plants, Radioactive waste processing), (*Radioactive waste processing, *Cost), Gaseous wastes, Radioactive wastes, Site selection.

For abstract, see NSA 29 05, number 09984.

18H. Radioactivity

AD-775 128/2GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
SPATIAL DISTRIBUTION OF DOSE RATE FROM A POINT ISOTROPIC NEUTRON SOURCE IN AIR AND AT THE AIR-GROUND INTERFACE,
S. F. Degtyarev, and V. I. Kukhtevich. 29 Jan 74, 13p Rept no. FTD-HT-23-861-73
Edited trans. of Voprosy Fiziki Zashchity Reaktorov (USSR) n2 p210-215 1966, by Paul J. Reiff.

Descriptors: *Neutron scattering, *Neutron flux, Dose rate, Air, Translations, USSR.

ARH-1837 PC$4.25/MF$1.45
Atlantic Richfield Hanford CO., Richland, Wash. (Usa).
MANAGEMENT OF THE HANFORD WATER TABLE AND WASTE MANAGEMENT IMPLICATIONS.
R. E. Tomlinson, R. E. Isaacson, D. J. Brown, and M. D. Veatch. 21 Sep 70, 43p

Descriptors: (*Hapo, *Geology), (*Ground water, *Contamination), (*Soils, Contamination), Fluid flow, Hydrology, Liquid wastes, Radioactive waste disposal, Radioactive wastes, Underground disposal, Waste management, Waste storage.

For abstract, see NSA 29 05, number 10155.

BNWL-B-237 PC$3.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
RADIATION SURVEY OF WAHLUKE SLOPE.
P. E. Bramson, and J. P. Corley. Dec 72, 13p
Contract AT(45-1)-1830

Descriptors: (*Hapo, *Radiation monitoring), (*Soils, Radiation monitoring), (*Plants, Radiation monitoring), (*Ground water, Radiation monitoring), Environment, Hanford production reactors, Radioactive waste disposal, Radioactivity, Sampling.

For abstract, see NSA 29 05, number 10159.

CEA-CONF-2443 PC$3.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Cadarache, 13 - Saint-Paul-les-Durance (France). Dept. De Protection.
TRANSFER MECHANISMS IN CULTIVATED SOILS OF WASTE RADIONUCLIDES FROM ELECTRONUCLEAR POWER PLANTS IN THE SYSTEM RIVER--IRRIGATED SOIL--UNDERGROUND WATER LEVEL.
A. Saas, and A. Grauby. 1973, 20p CONF-730503-9, SM-172/57
In French. U.S. Sales Only.

Descriptors: (*Nuclear power plants, *Site selection), (*Sodium 22, *Diffusion), (*Cesium 137, Diffusion), (*Strontium 85, Diffusion), Agriculture, Antimony 124, Aqueous solutions, Cerium 141, Chemical properties, Cobalt 60, Crops, Drinking water, Ecosystems, Environment, Food chains, Ground water, Human populations, Iodine 131, Iron 59, Irrigation, Liquid wastes, Manganese 54, Plants, Radiation hazards, Radioactive wastes, Radioactivity, Radionuclide migration, Rivers, Soils, Surface waters, Waste disposal, Water pollution, Zinc 65.

For abstract, see NSA 29 05, number 10160.

CEA-R-4532 PC$5.50/MF$1.45
Cea Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France).
DECHANNELING OF ALPHA PARTICLES BY HYDROGEN ATOMS IN PALLADIUM.
J. J. Quillico. Dec 73, 68p
In French. U.S. Sales Only.

Descriptors: (*Alpha particles, *Channeling), (*Palladium, *Charged-particle transport), Cross sections, Hydrogen.

For abstract, see NSA 29 05, number 11680.

NRPB-R-12 PC$3.50/MF$1.45
National Radiological Protection Board, Harwell (Uk).
CALIBRATION OF A MONSANTO CASCADE IMPACTOR WITH A MONODISPERSE AEROSOL.
D. T. O'Connor. Aug 73, 30p
U.S. Sales Only.

Descriptors: (*Cascade impactors, *Calibration), (*Radon, *Aerosol monitoring), Absorption spectroscopy, Aerosol generators, Aerosols, Methylene blue, Mines, Radiation monitoring, Size, Spheres.

For abstract, see NSA 29 05, number 10059.

ORNL-TM-4266 PC$5.25/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
EFFECTS OF AIR--DENSITY PERTURBATIONS ON THE TRANSPORT OF GAMMA RAYS PRODUCED BY POINT GAMMA-RAY SOURCES.
B. J. McGregor, and F. R. Mynatt. Dec 73, 22p
Contract W-7405-eng-26

Descriptors: (*Air, *Photon transport), (*Gamma transport theory, Nuclear explosions), (*Nuclear explosions, *Gamma radiation), Atmospheric explosions, Disturbances, Emission spectra, Gamma sources, M codes, Monte carlo method, Nuclear weapons, Point sources.

For abstract, see NSA 29 05, number 11691.

ORNL-TM-4322 PC$6.25/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
EXREM III COMPUTER CODE FOR ESTIMATING EXTERNAL RADIATION DOSES TO POPULATIONS FROM ENVIRONMENTAL RELEASES.
D. K. Trubey, and S. V. Kaye. Dec 73, 82p
Contract W-7405-eng-26

Descriptors: (*Computer codes, *E codes), (*Radiation doses, Computer codes), (*Populations, Radiation doses), Air, Beta particles, Contamination, Electrons, Gamma radiation, Positrons, Surfaces, Water, X radiation.

For abstract, see NSA 29 05, number 11692.

ORNL-TM-4335 PC$6.25/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
RADIATION TRANSPORT CROSS-SECTION SENSITIVITY ANALYSIS: A GENERAL APPROACH ILLUSTRATED FOR A THERMONUCLEAR SOURCE IN AIR.
D. E. Bartine, E. M. Oblow, and F. R. Mynatt. Dec 73, 84p
Contract W-7405-eng-26

Descriptors: (*Air, *Neutron transport), (*Gamma radiation, *Radiation doses), (*Neutrons, Radiation doses), (*Thermonuclear explosions, Radiation doses), Cross sections, Perturbation theory, Photon transport, Sensitivity.

For abstract, see NSA 29 05, number 11693.

ORNL-4903 PC$7.60/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
HEALTH PHYSICS DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING JULY 31, 1973.
Sep 73, 211p
Contract W-7405-eng-26

Descriptors: (*Radiation protection, *Research programs), Education, Information systems, Urban populations.

For abstract, see NSA 29 05, number 11686.

SSI-1972-26 PC$5.75/MF$1.45
Statens Straalskyddsinstitut, Stockholm (Sweden).
SECONDARY RADIATION FROM A SPHERIC TISSUE EQUIVALENT PHANTOM IRRADIATED WITH EXP 60 CO GAMMA - RADIATION AND 6 MV X RADIATION.
B. Nilsson. Aug 72, 75p
In Swedish. U.S. Sales Only.

Descriptors: (*Gamma radiation, *Multiple scattering), (*X radiation, Multiple scattering), (*Phantoms, *Photon transport), Cobalt 60, Irradiation, Radiation protection, Radiotherapy, Secondary emission, Tissue-equivalent materials.

For abstract, see NSA 29 05, number 11694.

SSI-1972-28 PC$3.00/MF$1.45
Statens Straalskyddsinstitut, Stockholm (Sweden).
BUILDUP STUDIES AT AIR CAVITIES WITH THIN THERMOLUMINESCENT DOSIMETERS.
B. O. Nilsson, and P. O. Schnell. Sep 72, 20p
U.S. Sales Only.

Descriptors: (*Phantoms, *Photon transport), (*Polystyrene, Photon transport), (*Gamma radiation, *Buildup), Air, Cobalt 60, Radiation doses, X radiation.

For abstract, see NSA 29 05, number 11695.

18I. Reactor Engineering and Operation

ANCR-1115 PC$7.60/MF$1.45
Aerojet Nuclear CO., Idaho Falls, Idaho (Usa).
BOILING WATER REACTOR-FULL LENGTH EMERGENCY CORE COOLING HEAT TRANSFER (BWR-FLECHT) TESTS PROJECT. FINAL REPORT ON ATMOSPHERIC PRESSURE STAINLESS STEEL EXPERIMENTS.
R. W. Griebe, and J. W. McConnell. Nov 73, 203p
Contract AT(10-1)-1375

Descriptors: (*Bwr type reactors, *Loss of coolant), (*Core spray systems, *Performance testing), (*Core flooding systems, Performance testing), Eccs, Fuel element clusters, Heat transfer, Heaters, Simulation, Stainless steels.

For abstract, see NSA 29 05, number 11992.

ANL/EBR-68 PC$5.00/MF$1.45
Argonne National Lab., Ill. (Usa); Argonne National Lab., Idaho Falls, Idaho (Usa).
EVALUATION OF EX-REACTOR LOADING EVENT ON HIGH-FLUENCE EBR-II CONTROL-ROD THIMBLE 5E3.
J. E. Flinn, D. Krajcinovic, R. D. Phipps, D. G. Franklin, and S. C. Miller. Feb 73, 59p
Contract W-31-109-eng-38

Descriptors: (*Ebr-2 reactor, Reactor components), (*Reactor components, *Fractures), Control elements, Physical radiation effects, Stainless steel-304, Stress analysis.

For abstract, see NSA 29 05, number 12180.

ANL-8041 PC$4.00/MF$1.45
Argonne National Lab., Ill. (Usa).
DEFORM-II: MATHEMATICAL ANALYSIS OF ELASTIC, VISCOUS, AND PLASTIC DEFORMATIONS OF A REACTOR FUEL PIN.
A. Watanabe. Aug 73, 33p
Contract W-31-109-eng-38

Descriptors: (*Fast reactors, Fuel pins), (*Fuel pins, *Deformation), Analytical solution, D codes, Elasticity, Excursions, Failures, Fuel cans, Mathematical models, Plasticity, Stress analysis, Viscous flow.

For abstract, see NSA 29 05, number 11993.

CEA-CONF-2222 PC$3.75/MF$1.45
PROGRAM OF STUDIES BEGUN BY THE COMMISSARIAT A L'ENERGIE ATOMIQUE IN THE DOMAIN OF THE APPLICATION OF SOME NONDESTRUCTIVE CONTROLS TO THE SAFETY OF REACTORS.
B. Barrachin, N. Chretien, A. Prot, R. Roche, and R. Saglio. 5 Dec 72, 32p CONF-730217-1
In French. U.S. Sales Only.

Descriptors: (*Reactor components, Nondestructive testing), (*Nondestructive testing, *Research programs), Acoustic emission testing, Industrial radiography, Pressure vessels, Reactor safety, Stainless steels, Ultrasonic testing, Welded joints.

For abstract, see NSA 29 05, number 12075.

CEA-CONF-2231 PC$4.25/MF$1.45
BALANCE OF STUDIES AND OF DEVELOPMENT OF COMPONENTS OF COMMAND CONTROL OF NUCLEAR POWER STATIONS. PERSPECTIVE FOR A MEDIUM TERM.
J. Furet. 43p CONF-730108-6
In French. U.S. Sales Only.

Descriptors: (*Reactor control systems, *Reviews), (*Nuclear power plants, Reactor control systems), Economics, Reactor instrumentation.

For abstract, see NSA 29 05, number 12181.

CEA-CONF-2256 PC$3.00/MF$1.45
SURVEILLANCE OF REACTORS BY THE METHODS OF DETECTION OF EMISSION OF WAVES OF CONSTRAINT AND BY ACOUSTIC DETECTION.
B. Gasc, and E. G. Tomachevsky. 19p CONF-730108-12, SM-168/D/6
In French. U.S. Sales Only.

Descriptors: (*Reactor components, *Acoustic emission testing), Inspection, Reactor materials.

For abstract, see NSA 29 05, number 12076.

CEA-CONF-2349 PC$3.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France). Dept. De Surete Nucleaire.
NUCLEAR QUALITY.
A. Prot. 1973, 10p
In French. U.S. Sales Only.

Descriptors: (*Quality control, *Nuclear engineering), Equipment, Legal aspects, Management, Personnel, Radiation protection, Safety, Specifications.

For abstract, see NSA 29 05, number 12408.

CEA-CONF-2353 PC$3.25/MF$1.45
RELIABILITY OF A METHOD OF SAFETY ANALYSIS.
A. Carnino, and R. Quenee. 24p CONF-730217-4, SM-169/13
In French. U.S. Sales Only.

Descriptors: (*Reactor components, *Reliability), (*Reactor protection systems, Reliability), Diagrams, Mathematical models, Reactor accidents, Reactor safety.

For abstract, see NSA 29 05, number 11994.

CEA-CONF-2419 PC$3.50/MF$1.45
Cea Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France).
STUDY OF THE REACTIONS BETWEEN (U,PU)O SUB 2 FUEL AND SODIUM.
M. Housseau, J. F. Marin, F. Anselin, and G. Dean. 26p CONF-730726-7
In French. U.S. Sales Only.

Descriptors: (*Uranium dioxide, *Chemical reactions), (*Plutonium oxides, Chemical reactions), (*Sodium, Chemical reactions), (*Rapsodie reactor, *Fuel-coolant interactions), Diffusion, Failures, Fission products, Fuel cans.

For abstract, see NSA 29 05, number 11995.

EURFNR-1118 PC$5.25/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Angewandte Systemtechnik und Reaktorphysik.
NEW DEFINITION OF RELIABILITY, CONTINUOUS LIFETIME PREDICTION, AND LEARNING PROCESSES.
L. Caldarola. Jul 73, 65p KFK-1847, EUR-4969
U.S. Sales Only.

Descriptors: (*Reactor components, *Reliability), (*Electronic equipment, Reliability), Failures, Lifetime, Reactor maintenance.

For abstract, see NSA 29 05, number 12125.

FIND-50404-R1 PC$4.00/MF$1.45
Usaec Technical Information Center, Oak Ridge, Tenn.
FIND: NORTH ANNA POWER STATION, UNITS 3 AND 4.
J. M. Asher. Dec 73, 30p

Descriptors: (*North anna-3 reactor, *Reactor safety), (*North anna-4 reactor, Reactor safety), Indexes.

For abstract, see NSA 29 05, number 12013.

KFK-1858 PC$7.75/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Reaktorentwicklung.
CONTRIBUTION TO THE MODELING OF SODIUM BOILING UNDER ACCIDENT CONDITIONS IN FAST BREEDER REACTORS.
P. Wirtz. Oct 73, 112p
In German. U.S. Sales Only.

Descriptors: (*Lmfbr type reactors, Reactor accidents), (*Reactor accidents, *Boiling), B codes, Fbr type reactors, Fuel pins, Heat transfer, Hydraulics, Liquid flow, Mathematical models, Reactor safety, Sodium, Temperature distribution.

For abstract, see NSA 29 05, number 12026.

ORNL-NSIC-55(Vol.1) PC$15.00/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
DESIGN DATA AND SAFETY FEATURES OF COMMERCIAL NUCLEAR POWER PLANTS. VOL. I. DOCKET NO. 50-3 THROUGH 50-295.
F. A. Heddleson. Dec 73, 224p
Contract W-7405-Eng-26

Descriptors: (*Nuclear power plants, *Equipment protection devices), Design, Reactor safety, Reactor sites, Safety engineering, Usa.

For abstract, see NSA 29 05, number 12029.

PB-228 864/5GA PC$3.00/MF$1.45
Cornell Univ., Ithaca, N.Y. Cornell Energy Project.
NUCLEAR INSURANCE: AN ESTIMATE OF THE COST OF THE NUCLEAR HAZARD,
Robert W. Schleicher. Oct 71, 24p* Paper-71-13
NSF-RA/N-71-013
Grant NSF-GI-29903

Report on National Energy Needs and Environmental Quality.

Descriptors: *Nuclear power plants, *Nuclear reactor accidents, *Radiation hazards, *Insurance, Cost estimates, Government policies, Liabilities, Risk.
Identifiers: Price-Anderson Indemnity Act.

The paper presents an investigation of the cost of the nuclear hazard as estimated by the nuclear insurance industry and the United States Government. The investigation is divided into two parts: (1) The description of the nuclear insurance program in the United States including private and governmental coverage, premium rates and indemnification fees. (2) A calculation of the expected cost of the nuclear hazard from information about the permium rate structure and indemnification fees. (Modified author abstract)

SGAE-2171 PC$3.50/MF$1.45
Oesterreichische Studiengesellschaft fuer Atomenergie G.M.B.H., Seibersdorf.
THEORETICAL MODEL FOR THE DYNAMICS OF THE VOEST STEAM LOOP AT THE SEIBERSDORF RESEARCH CENTER.
H. Bruneder, and A. Nevyjel. Sep 73, 27p
In German. U.S. Sales Only.

Descriptors: (*Secondary coolant circuits, *Fluid mechanics), Coolant loops, Differential equations, Excursions, Mathematical models, Reactors, Steam generators.

For abstract, see NSA 29 05, number 12134.

TID-26498 PC$4.25/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
ENGINEERING ASPECTS OF HEAT DISSIPATION IN WATER BODIES.
P. J. Ryan. 1973, 45p

Descriptors: (*Nuclear power plants, Reactor cooling systems), (*Reactor cooling systems, *Economics), Configuration, Cooling towers, Engineering, Environment, Performance, Reactor operation, Waste heat.

For abstract, see NSA 29 05, number 12135.

18J. Reactor Materials

AAEC/E-250 PC$4.00/MF$1.45
Australian Atomic Energy Commission Research Establishment, Lucas Heights.
ASSESSMENT OF SOME ORGANIC BINDERS FOR THE FABRICATION OF URANIUM DIOXIDE FUEL PELLETS.
E. J. Ramm, and C. E. Webb. Dec 72, 38p
U.S. Sales Only.

Descriptors: (*Fuel pellets, *Fabrication), (*Uranium dioxide, Fabrication), Binders, Lubrication, Microstructure, Polyacrylates, Powders, Pva, Sintering.

For abstract, see NSA 29 05, number 10579.

AD-775 242/1GA PC$5.00/MF$1.45
Northwestern Univ Evanston Ill Technological Inst
SOME CONSIDERATIONS OF THE MELTING OF REACTOR FUEL PLATES AND RODS.
Technical rept.,
Antoine Lahoud, and Bruno A. Boley. Sep 73, 40p
Rept no. TR-3
Contract N00014-67-A-0356-0029

Descriptors: *Reactor fuel plates, *Reactor fuel rods, *Melting, Reactor fuel elements, Conduction(Heat transfer), Partial differential equations, Numerical integration, Reactor safety systems.
Identifiers: Design.

A preliminary analysis is presented of the gross melting of fuel plates and rods. Estimates are obtained of the extent of melting and of the rapidity with which it occurs. Analytical short-time solutions are obtained by the embedding technique. The effect of density changes are investigated. Approximate analytical long-time solutions are constructed, and the results are presented in a series of graphs. (Modified author abstract)

AD-775 297/5GA PC$4.50/MF$1.45
Naval Research Lab Washington D C
COOPERATIVE RADIATION EFFECTS SIMULATION PROGRAM.
Semiannual progress rept. 1 May-31 Oct 73,
L. E. Steele, and E. A. Wolicki. Feb 74, 110p Rept no. NRL-MR-2755
See also AD-765 731.

Descriptors: *Reactor materials, *Radiation effects, Damage, Ion implantation, Helium, Steel, Nickel, Microstructure, Neutron beams, Defects(Materials).
Identifiers: Steel 316.

The report describes progress in: (1) developing the NRL Code E-DEP-1 for energy deposition by heavy ions, (2) modifying the Manning and Pagett transport theory for the penetration of heavy ions near the surface, (3) an investigation of the total crosssection corresponding to the differential cross section of Lindhard, Nielsen, and Scharaff, (4) an investigation of the temperature dependence of nickel-ion damage in nickel, (5) a study of the flux (dose rate) effects for 2.8 MeV 58Ni(+) irradiations of pure nickel, (6) studies of helium mobility in metals, (7) the cyclotron helium implantation facility, and (8) the effect of cyclotron implanted helium on the fatigue behavior and microstructure of 316 stainless steel at 650C.

ANL-CT-73-28 PC$3.00/MF$1.45
Argonne National Lab., Ill. (Usa).
BOUNDS FOR CREEP IN THICK SPHERICAL PRESSURE VESSELS.
W. S. Edelstein, and R. A. Valentin. Oct 73, 14p

Descriptors: (*Pressure vessels, *Creep), Equations, Spheres, Stress relaxation.

For abstract, see NSA 29 05, number 10057.

CEA-CONF-2238 PC$3.00/MF$1.45
IN-PILE BEHAVIOR OF CERMETS UO SUB 2 – MO.
B. Francois, P. Chenebault, Y. Kauffmann, and J. P. Stora. 1972, 19p CONF-720613-6
In French. U.S. Sales Only.

Descriptors: (*Uranium dioxide, *Physical radiation effects), (*Molybdenum alloys, Physical radiation effects), (*Thermoelectric generators, *Fuel pellets), Burnup, Cermets, Fission products, Gases, Neutron beams, Nuclear fuels, Pile neutrons, Swelling, Very high temperature.

For abstract, see NSA 29 05, number 10580.

CEA-CONF-2415 PC$3.25/MF$1.45
Cea Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France). Div. De Metallurgie et d'Etude des Combustibles Nucleaires.
METHODS IN USE AT CEN SACLAY FOR THE TRANSPORT, STORAGE, REMOTE HANDLING, AND EXAMINATION OF FUEL ELEMENTS FOR A LIGHT WATER CHANNEL.
E. Roussel. 25p CONF-730667-4
In French. U.S. Sales Only.

Descriptors: (*Bwr type reactors, Fuel elements), (*Pwr type reactors, Fuel elements), (*Fuel elements, *Inspection), Remote handling, Storage, Transport.

For abstract, see NSA 29 05, number 10789.

CEA-CONF-2416 PC$4.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Grenoble, 38 (France). Service des Piles.
GAMMA SCANNING AT THE LECI (CEN SACLAY) AND AT THE LAMA (CEN GRENOBLE).
M. Chevalier, J. P. Hulot, A. Lachambre, B. Mansard, and J. Monnier. 37p CONF-730667-2
In French. U.S. Sales Only.

Descriptors: (*Fuel elements, *Gamma fuel scanning), Data acquisition, France, Hot labs.

For abstract, see NSA 29 05, number 10087.

CEA-CONF-2422 PC$4.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France).
IRRADIATION OF FUELS WITH DENSITY OF 80 AND 85% IN RAPSODIE.
Y. Carteret, M. Conte, M. Trotabas, B. Kryger, and R. Lallement. 1972, 39p CONF-730726-5
In French. U.S. Sales Only.

Descriptors: (*Rapsodie reactor, Fuel pins), (*Fuel pins, *Physical radiation effects), Deformation, Failures, Fuel cans, Hastelloy x, Irradiation, Plutonium oxides, Stainless steel-316, Swelling, Uranium oxides.

For abstract, see NSA 29 05, number 12163.

CEA-CONF-2425 PC$3.25/MF$1.45
Cea Centre d'Etudes Nucleaires de Grenoble, 38 (France). Dept. De Metallurgie.
IRRADIATION OF A BROKEN FUEL PIN IN A SODIUM LOOP.
J. P. Hairion, J. C. Cauvin, P. Chenebault, R. Delmas, and A. Lhermenier. 24 Apr 73, 22p
CONF-730726-11
In French. U.S. Sales Only.

Descriptors: (*Fuel pins, *Failures), (*Sodium cooled reactors, *Failed element detection), Fission products, Fuel cans, Gases, In pile loops, Physical radiation effects, Plutonium oxides, Sodium, Uranium dioxide.

For abstract, see NSA 29 05, number 12164.

CEA-CONF-2428 PC$3.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Cadarache, 13 - Saint-Paul-les-Durance (France). Dept. De Developpement des Elements Combustibles.
AUTOMATIC PROCESSING OF INFORMATION ON THE PRODUCTION OF A NON-DESTRUCTIVE CONTROL CHAIN FOR TUBES.
A. Samoel. 7 Mar 73, 10p CONF-730606-7
In French. U.S. Sales Only.

Descriptors: (*Fuel cans, Nondestructive testing), (*Nondestructive testing, *Data processing), Computers, Data transmission, France, Quality control.

For abstract, see NSA 29 05, number 10088.

DP-1337 PC$4.00/MF$1.45
Du Pont de Nemours (E.I.) and CO., Aiken, S.C. (Usa). Savannah River Lab.
DISSOLVING URANIUM OXIDE--ALUMINUM FUEL.
W. C. Perkins. Nov 73, 23p
Contract AT(07-2)-1

Descriptors: (*Uranium oxides u3o8, *Dissolution), (*Aluminium, Dissolution), (*Spent fuels, *Reprocessing), (*U3o8, Dissolution), Chemical radiation effects, Enriched uranium, Irradiation, Mechanical properties, Mercury nitrates, Nitric acid.

For abstract, see NSA 29 05, number 09999.

EIR-230 PC$5.25/MF$1.45
PLUTONIUM FUEL PROGRAM ANNUAL REPORT, 1972.
Apr 73, 57p
In German. U.S. Sales Only.

Descriptors: (*Nuclear fuels, *Chemical preparation), Br-2 reactor, Burnup, Compatibility, Dido reactor, Microspheres, Neutron beams, Physical properties, Physical radiation effects, Pile neutrons, Plutonium carbides, Plutonium nitrates, Plutonium oxides, Research programs, Sol-gel process, Uranium carbides, Uranium dioxide.

For abstract, see NSA 29 05, number 10594.

HEDL-SA-592 PC$4.25/MF$1.45
Hanford Engineering Development Lab., Richland, Wash. (Usa).
ROOM-TEMPERATURE OXIDATION OF (U,PU)O/SUB 2-X/.
R. E. Woodley, and R. L. Gibby. Sep 73, 42p
CONF-731041-6
Contract AT(45-1)-2170

Descriptors: (*Uranium oxides, *Oxidation), (*Plutonium oxides, Oxidation), (*Fuel pellets, Oxidation), Cracks, Medium temperature, Molecules, Oxygen, Stoichiometry, Surface properties, Water vapor.

For abstract, see NSA 29 05, number 10596.

JUL-969-RW PC$7.00/MF$1.45
Kernforschungsanlage Juelich G.M.B.H. (F.R. Germany). Inst. Fuer Reaktorwerkstoffe.
ABOUT DEVELOPMENT OF A MATRIX-MATERIAL FOR PRODUCTION OF PRESSED FUEL ELEMENTS FOR HIGH-TEMPERATURE REACTORS.
M. Hrovat, H. Nickel, and K. Koizlik. Jun 73, 98p
In German. U.S. Sales Only.

Descriptors: (*Fuel elements, *Fabrication), (*Graphite, *Matrix materials), (*Htgr type reactors, Fuel elements), Mechanical properties, Physical properties, Pressing, Production, Thermodynamic properties.

For abstract, see NSA 29 05, number 10598.

JUL-989-RW PC$7.50/MF$1.45
Kernforschungsanlage Juelich G.M.B.H. (F.R. Germany). Inst. Fuer Reaktorwerkstoffe.
URANIUM-CONTAMINATION IN PYROLITIC CARBON BY THE PRODUCTION OF COATED PARTICLES WITH OXIDE FUEL.
E. Wallura. Aug 73, 109p
In German. U.S. Sales Only.

Descriptors: (*Uranium, *Diffusion), (*Uranium dioxide, Coated fuel particles), (*Pyrolytic carbon, Diffusion), (*Coated fuel particles, Pyrolytic carbon), Coatings, Deposition, Distribution, Fick laws, Gases, Spheres, Very high temperature.

For abstract, see NSA 29 05, number 10599.

KFK-1835 PC$4.00/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Reaktorbauelemente.
ADVANTAGES AND DISADVANTAGES OF THYRISTORS AT THE POWER SUPPLY OF ELECTRICALLY HEATED RODS WITH HIGH POWER DENSITY.
L. Krebs, S. Malang, H. M. Politzky, and K. Rust. Oct 73, 38p
In German. U.S. Sales Only.

Descriptors: (*Fuel rods, *Simulation), (*Heaters, *Power supplies), Control systems, Thyristors.

For abstract, see NSA 29 05, number 12165.

N74-15388/3GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
COMPATIBILITY OF REFRACTORY MATERIALS FOR NUCLEAR REACTOR POISON CONTROL SYSTEMS.
J. H. Sinclair. Jan 74, 38p NASA-TM-X-2963, E-7581

Descriptors: *Control rods, *Nuclear reactors, *Poisoning (Reaction inhibition), *Refractory materials, Boron carbides, Hafnium compounds, High temperature tests, Tantalum compounds, Zirconium compounds.

For abstract, see STAR 1206

ORNL-tr-2733 PC$5.00/MF$1.45
Kernforschungsanlage Juelich G.M.B.H. (F.R. Germany).
STATIONARY AND DYNAMIC DEPOSITION OF SILICON CARBIDE ON COATED FUEL PARTICLES.
E. Gyarmati, and H. Nickel. Nov 72, 57p
Translated by R. Gregg Mansfield from JUL--900-RW.

Descriptors: (*Silicon carbides, *Chemical vapor deposition), (*Coated fuel particles, *Surface coating), Argon, Density, Efficiency, Fluidized bed, Hydrogen, Organic chlorine compounds, Pyrolytic carbon, Silanes, Very high temperature.

For abstract, see NSA 29 05, number 10602.

ORNL-tr-2788 PC$3.25/MF$1.45
Cea Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France).
MECHANICAL DECLADDING OF STAINLESS-STEEL-CLAD OXIDE FUELS.
G. Matcheret, and M. Bourgeois. Aug 73, 21p
Translated by Martha Gerrard from CEA-R--4469.

Descriptors: (*Spent fuel elements, *Mechanical decladding), Fuel cans, Lmfbr type reactors, Oxides, Reprocessing, Stainless steels, Water cooled reactors.

For abstract, see NSA 29 05, number 10000.

RD/B/N-2616 PC$3.25/MF$1.45
Central Electricity Generating Board, Berkeley (Uk). Berkeley Nuclear Labs.
ADDITIONAL DATA ON THE BURNABLE POISON GD SUB 2 O SUB 3 /AL SUB 2 O SUB 3 , AND THE COMPOUND GDALO SUB 3 .
J. D. Noden. Jul 73, 23p
U.S. Sales Only.

Descriptors: (*Gadolinium oxides, *Burnable poisons), (*Aluminium oxides, Burnable poisons), (*Htgr type reactors, Burnable poisons), Carbon dioxide, Carbon monoxide, Chemical properties, Chemical reactions, Compatibility, Graphite, Hydrogen, Methane, Physical properties, Thermal conductivity, Thermal expansion, Water vapor.

For abstract, see NSA 29 05, number 10603.

RD/B/N-2685 PC$3.00/MF$1.45
Central Electricity Generating Board, Berkeley (Uk). Berkeley Nuclear Labs.
ENERGY CONSIDERATIONS OF INTERGRANULAR PORES AND THEIR RELEVANCE TO GAS RELEASE IN FUELS.
W. Beere. Jul 73, 14p

Descriptors: (*Nuclear fuels, *Degassing), (*Fission products, *Gaseous diffusion), (*Fuel pellets, *Porosity), Bubbles, Equilibrium, Free energy, Gases, Grain boundaries, Interfaces, Shape, Stability, Surfaces, Swelling, Voids.

For abstract, see NSA 29 05, number 12166.

RT/CHI-(73)4 PC$3.50/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
GAS CHROMATOGRAPHIC ANALYSIS OF THE DEGRADATION PRODUCTS OF TBP IN SOLUTIONS IN THE REPROCESSING OF IRRADIATED NUCLEAR FUELS.
A. Brignocchi, G. M. Gasparini, and M. Pizzichini. 5 Jul 73, 28p
In Italian. U.S. Sales Only.

Descriptors: (*Tbp, *Decomposition), Gas chromatography, Radiolysis, Reprocessing, Spent fuels.

For abstract, see NSA 29 05, number 10001.

RT/ING-(73)12 PC$3.75/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
PRESSURE INFLUENCE ON BUNDLE TWO-PHASE FLOW PRESSURE DROPS.
V. Marinelli, and P. Grillo. 18 Jan 73, 32p CONF-710606-21, CONF-710630-2
U.S. Sales Only.

Descriptors: (*Fuel element clusters, Two-phase flow), (*Two-phase flow, *Pressure gradients), Friction, Pressure dependence, Steam, Water.

For abstract, see NSA 29 05, number 10069.

TID-26496 PC$3.00/MF$1.45
Argonne National Lab., Ill. (Usa).
LOADING OF PARTICULATE FUELS INTO COMPLEX SHAPES.
R. A. Jandrisevits, H. R. Fraser, and M. H. Richardson. 3 Sep 65, 15p

Descriptors: (*Fuel elements, *Fabrication), (*Fuel particles, *Compacting), (*Fast reactors, Fuel elements), Efficiency, Fuel cans, Mechanical vibrations, Spheres, Steels, Tubes.

For abstract, see NSA 29 05, number 10664.

TRITA-MEL-8 PC$3.00/MF$1.45
Kungliga Tekniska Hoegskolan, Stockholm (Sweden).
BACTERIAL LEACHING OF URANIUM SHALE.
T. Bjoerling. Sep 73, 20p
In Swedish. U.S. Sales Only.

Descriptors: (*Uranium ores, *Leaching), Bacteria, Ore enrichment, Oxygen, Particle size, Ph value, Shales, Sweden.

For abstract, see NSA 29 05, number 09907.

18K. Reactor Physics

AEEW-R-530 PC$4.00/MF$1.45
Ukaea Reactor Group, Winfrith. Atomic Energy Establishment.
PRESTO I: A PROGRAMME FOR MULTI-GROUP SOURCE-SINK CALCULATIONS IN PRESSURE TUBE REACTOR LATTICES.
F. R. Allen. Feb 68, 39p
U.S. Sales Only.

Descriptors: (*Pressure tube reactors, *Reactor kinetics), (*Computer codes, *P codes), Mathematical models, Multigroup theory, Neutron flux, Numerical solution, Reactor channels, Reactor lattices, Two-dimensional calculations.

For abstract, see NSA 29 05, number 12045.

BNWL-1656 PC$3.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).

UNCERTAINTIES IN THE ANALYSIS OF PLUTONIUM FUELED LIGHT WATER MODERATED ASSEMBLIES.
R. C. Liikala, V. O. Uotinen, and U. P. Jenquin.
May 73, 137p
Contract AT(45-1)-1830

Descriptors: (*Water moderated reactors, Reactor cores), (*Thermal reactors, Reactor cores), (*Reactor cores, *Multiplication factors), Criticality, Fuel elements, Plutonium oxides, Reactivity, Reactor kinetics, Uranium dioxide.

For abstract, see NSA 29 05, number 12046.

COO-3384-1 PC$3.25/MF$1.45
New York Univ., N.Y. (Usa).
(NEUTRON AND PHOTON TRANSPORT). FINAL REPORT.
R. Aronson. 4 Jun 73, 24p
Contract AT(11-1)-3384

Descriptors: (*Neutron transport theory, *Research programs), (*Gamma transport theory, Research programs), Boundary conditions, Eigenvalues, Geometry, Polarization, Scattering, Slabs.

For abstract, see NSA 29 05, number 11683.

KFKI-73-48 PC$3.25/MF$1.45
Kozponti Fizikai Kutato Intezet, Budapest (Hungary).
NEUTRON THERMALIZATION CODE RJT4-CATHY.
J. Gado, Z. Szatmary, and S. El-Wakil. 22p
U.S. Sales Only.

Descriptors: (*Reactor cells, *Neutron transport), (*Computer codes, *R codes), Cylindrical configuration, Reactor lattices, Thermalization.

For abstract, see NSA 29 05, number 12049.

18N. Snap Technology

GA-11004 PC$5.50/MF$1.45
Gulf General Atomic CO., San Diego, Calif. (Usa).
POST-OPERATIONAL EXAMINATIONS OF TWO CARBIDE-FUELED IN-PILE CONVERTERS.
L. Yang, M. H. Horner, and F. L. Cochran. 30 Sep 70, 67p
Contract AT(04-3)-167

Descriptors: (*Thermionic converters, *Performance testing), (*Uranium carbides, *Physical radiation effects), (*Zirconium carbides, Physical radiation effects), Burnup, Configuration, Deformation, Inspection, Swelling.

For abstract, see NSA 29 05, number 11985.

GA-9595 PC$6.50/MF$1.45
Gulf General Atomic CO., San Diego, Calif. (Usa).
THERMIONIC EMITTER DIMENSIONAL STABILITY ANALYSIS.
A. J. Gietzen. 30 Apr 71, 89p
Contract AT(04-3)-167

Descriptors: (*Thermionic converters, *Performance testing), (*Uranium dioxide, *Deformation), Configuration, Design, Elasticity, Stress analysis, Swelling, Thermal stresses.

For abstract, see NSA 29 05, number 11984.

GKSS-73-E-20 PC$5.25/MF$1.45
Gesellschaft fuer Kernenergieverwertung in Schiffbau und Schiffahrt M.B.H., Geesthacht-Tesperhude (F.R. Germany).
DETERMINATION METHOD FOR THE OPTIMIZATION OF NUCLEAR AND CONVENTIONAL CONTAINER SHIP FLEETS.
W. Pihowicz. 1973, 62p
In German. U.S. Sales Only.

Descriptors: (*Ships, *Economics), (*Nuclear ships, Economics), Comparative evaluations, Cost, Mathematical models, Optimization, Propulsion.

For abstract, see NSA 29 05, number 11986.

N74-15389/1GA PC$4.25/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ASSESSMENT OF LIGHTWEIGHT MOBILE NUCLEAR POWER SYSTEMS.
J. L. Anderson, and F. E. Rom. 1973, 45p NASA-TM-X-71482, E-7806
Conf-Presented at Winter Meeting of the AM. Nucl. Soc., San Francisco, 11-15 Nov. 1973.

Descriptors: *Feasibility analysis, *Flight vehicles, *Nuclear power reactors, *Portable equipment, Bibliographies, Cost analysis, Reactor technology.

For abstract, see STAR 1206

ORNL-4932 PC$5.45/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
ORNL ISOTOPIC POWER FUELS QUARTERLY REPORT FOR PERIOD ENDING SEPTEMBER 30, 1973.
E. Lamb. Dec 73, 44p
Contract W-7405-eng-26

Descriptors: (*Curium 244, Radioisotope heat sources), (*Radioisotope heat sources, *Research programs), (*Thermoelectric generators, Radioisotope heat sources), Carbon, Compatibility, Curium oxides, Fabrication, Impact strength, Isotope production, Specific heat, Stainless steel-316, Tantalum alloy-t111, Vapor pressure, Platinum base alloys, Rhodium alloys, Tungsten alloys, Hafnium base alloys, Palladium alloys, Platinum alloys, Tin alloys, Iridium base alloys.

For abstract, see NSA 29 05, number 10327.

19. ORDNANCE

19A. Ammunition, Explosives, and Pyrotechnics

AD-774 804/9GA PC$4.00/MF$1.45
Ballistic Research Labs Aberdeen Proving Ground Md
WIND-TUNNEL TEST OF A SPINNING, LOW-DRAG PROJECTILE WITH CANTED BORE RIDERS AT MACH NUMBERS FROM 1.75 TO 2.5.
Memorandum rept.,
Klaus O. Opalka. Jan 74, 81p Rept no. BRL-MR-2349

Descriptors: *Spin stabilized ammunition, *Projectiles, *Wind tunnel tests, Supersonic characteristics, Angle of attack, Spinning(Motion), Magnus effect.
Identifiers: Bore riders.

Test data are reported for a spin-stabilized, low-drag projectile with and without bore riders mounted at various angles of cant with respect to the shell axis. Wind-tunnel tests were performed with and without spin at four Mach numbers evenly spaced from 1.75 to 2.5; some of the resulting aerodynamic coefficients are plotted versus spin rate, angle of attack or Mach number. (Author)

AD-774 808/0GA PC$5.00/MF$1.45
Modern Army Selected Systems Test Evaluation and Review Fort Hood Tex
SCATTERABLE ANTIPERSONNEL MINE TEST DATA SUMMARY.
Final rept. 24 Sep-5 Oct 73,
John J. Ott. Feb 74, 39p Rept no. MASSTER-Test-FM-230

Descriptors: *Antipersonnel mines, *Wire, *Passive defense, Targets, Detection, Computerized simulation, Land mines.
Identifiers: *Tripwires.

The Scatterable Antipersonnel Mine Test was conducted at Fort Hood, Texas, from 24 September to 5 October 1973. The test was conducted to collect data on the detectability of tripwires. Resulting data tables were used in a computer simulation on tripwire effectiveness. The test provided information on some effective tripwire countermeasures. (Author)

AD-774 817/1GA PC$3.00/MF$1.45
AAI Corp Baltimore Md
DIRECTIONAL LIGHT, PYROTECHNIC.
Final rept. 15 Jun-31 Dec 73,
Robert E. Itnyre, and Robert W. Schnepfe. Feb 74, 21p Rept no. AAI-ER-7713 LWL-CR-02F70
Contracts DAAD05-73-C-0543, DAAD05-72-C-0209

Descriptors: *Flares, Directional, Signal lights, Warfare, Pyrotechnics, Candles.

The U.S. Army Land Warfare Laboratory developed a Directional Pyrotechnic Light for use during night ambushes and other selected combat and noncombat uses. That design used an expedient candle made from two M127A1 Signal Candle Assemblies placed end to end to burn sequentially. Adaptation of these candles for use in the light required extensive modifications which were time consuming, expensive and hazardous. A one-piece candle was designed and fabricated which reduces manufacturing time and costs, is less hazardous to produce, and is compatible with and adaptable to standard industry manufacturing processes and procedures. The Directional Light has been tested, demonstrated, and, as a result, judged suitable for field evaluation. (Author)

AD-774 838/7GA PC$3.25/MF$1.45
Frankford Arsenal Philadelphia Pa
AN ANALYSIS OF VARIOUS PRIMER VENT CONFIGURATIONS IN 5.56 MM AMMUNITION,
Robert J. Krafcik. Aug 73, 34p Rept no. FA-R-2088

Descriptors: *Gun propellants, *Primers, *Vents, Interior ballistics, Solid propellants, Cartridges, Ammunition.
Identifiers: M-193 cartridges(5.56 mm), *Primer vents.

Statistical techniques were used to determine the ballistic effect of various primer vent configurations in 5.56 mm ammunition. The results indicate that the 5.56 mm standardized primer vent provides the most efficient ballistic system, i.e., the highest velocity-pressure ratio, of all vent configurations tested. It was also shown that velocity, chamber pressure, action time, propellant ignition time, temperature coefficient of velocity and the temperature coefficient of chamber pressure are affected by a change in primer vent cross-sectional area. (Author)

AD-774 843/7GA PC$3.75/MF$1.45
Picatinny Arsenal Dover N J
FAULT TREE ANALYSIS.
Technical rept.,
Waldemar F. Larsen. Jan 74, 73p Rept no. PA-TR-4556

Descriptors: *Reliability, *Boolean algebra, *Probability, *Safety and arming(Ordnance), Fuze functioning elements, Failure(Electronics), Faults, Isolation, Life(Durability).
Identifiers: *Fault tree analysis, *Failure analysis, *Fault isolation, Sympathetic failure, M-813 fuzes, XM-813 fuzes.

The report describes the procedure to be used for constructing fault trees, the application of Boolean

Algebra and the use of probability values in the final algebraic expressions. While not the only method which can be used, the fault tree technique is considered to be a very effective analytical tool in assessing system safety. This report supersedes Picatinny Arsenal Technical Report 3822. (Author)

AD-774 858/5GA PC$3.00/MF$1.45
Army Land Warfare Lab Aberdeen Proving Ground Md
105MM SUBCALIBER TRAINING DEVICE.
Final rept.,
John D. Buchanan. Feb 74, 23p Rept no. LWL-TR-74-16

Descriptors: *Gunnery, *Tanks(Combat vehicles), *Training ammunition, Subcaliber projectiles, Army personnel, Firing tests(Ordnance), Training, Firing mechanisms(Ammunition), Breech mechanisms.
Identifiers: M-68 guns(105mm), M-60 tanks, M-60Al tanks.

The purpose of the program was to design, test, and demonstrate feasibility of a subcAliber training device which could be fired from the 105mm M68 Gun on the M60 and M60A1 Tanks. The training device would be used in training exercises where the actual round could not be used because of safety requirements. The training device approximates the actual 105mm Round in size and weight. It consists of a .50 Caliber Spotting Rifle barrel and a specially designed bolt and breech mechanism inside a simulated 105mm shell body. The Caliber .50 M48A1 spotter tracer round is fired from this simulated shell using the 105mm M68 gun firing system on the M60 Tank. The final design was evaluated by 1st Armored Division in Germany and the results of these tests are included in the report. (Modified author abstarct)

AD-775 262/9GA PC$3.75/MF$1.45
Bureau of Mines Pittsburgh Pa Pittsburgh Mining and Safety Research Center
CONTINUOUS EXPLOSIVE FRAGMENTATION TECHNIQUES.
Final technical rept. Jun 72-Dec 73,
Richard W. Watson, and J. Edmund Hay. Feb 74, 52p Rept no. PMSRC-P78-4
ARPA Order-1579
See also AD-751 022.

Descriptors: *Underground structures, *Underground explosions, *Explosives, Fragmentation, Explosives initiators, Projectiles, Impact, Hypergolic ignition, Lasers, Ignition.
Identifiers: *Rapid excavation.

Research has been conducted relating to the optimization of explosives and initiation systems for a proposed automatic continuous drill-and-blast tunneling system. Experiments concentrated on the development, characterization and selection of explosives which could be automatically injected in bulk form into a borehole and which have optimized safety, initiation, energy and economic characteristics, and the development of reliable, economical, remote initiation systems. The experiments demonstrated that a variety of explosive systems exist whose detailed formulations can be tailored to minimize toxic fumes, optimize safety and initiation characteristics. (Modified author abstract)

AD-775 371/8GA PC$4.00/MF$1.45
Picatinny Arsenal Dover N J
RADIATION-INDUCED CHANGES IN EXPLOSIVE MATERIALS.
Technical rept.,
Louis Avrami, Henry J. Jackson, and Maurice S. Kirshenbaum. Dec 73, 81p Rept no. PA-TR-4602

Descriptors: *Explosives, *Radiation effects, *Gamma rays, Melting point, Infrared spectra, Differential thermal analysis, Impact, Azides, Barium compounds, Detonations, Ignition, HMX, Nitroguanidine, PETN, RDX, TNT, Thermogravimetric analysis, Tetryl.
Identifiers: Barium azides, DATB explosive, Phenylenediamine/trinitro, Benzene/trinitro, Nitro compounds.

A group of eleven explosive materials in powder and pellet form were subjected to Co60 gamma radiation and the results are tabulated and discussed. Teh explosives were studied using weight loss, dimensional change, vacuum stability, DTA, TGA, infrared spectra, melting point, impact sensitivity, explosion temperature and rates of detonation as a function of total gamma exposure up to and including levels of ten to the ninth power R. Based on this work, a damage threshold as a function of total gamma dose was determined for each material. The results indicate that the capability of the explosives studied to withstand Co60 gamma radiation decreases in the following order: TACOT = or > TATB = or > DATB = or > HMX = or > Tetryl = or > TNB = or > TNT = or > RDX = or > PETN > NGu > BaN6. (Author)

AD-775 378/3GA PC$5.25/MF$1.45
Picatinny Arsenal Dover N J
ELECTRONIC PROCESSES IN EXPLOSIVES INITIATION.
Technical rept.,
Harry D. Fair, Jr., David S. Downs, Arthur C. Forsyth, Wayne Garrett, and Marcel Blais. Dec 73, 45p Rept no. PA-TR-4607

Descriptors: *Explosives, *Ignition, *Band theory of solids, Photochemical reactions, Atomic energy levels, Electronic states, Decomposition, Azides, Lead compounds, Thallium compounds, Spectrometers, Detonations, Silver compounds, Photoconductivity, Absorption spectra, Optics, Activation energy, Transport properties.
Identifiers: Lead azides, Thallium azides, Silver azides.

The work describes the determination of the electronic energy level structure in explosives using low temperature optical absorption techniques and the determination of electronic transport properties by photoconductivity and related solid state measurements. Madelung potentials and electric energy levels were theoretically determined and indicate the nature of the bonding within the explosive crystal lattice. These studies have focused on the relationship between the chemical pseudostability of explosives and their electronic structure and have suggested novel mechanisms for initiation of primary and secondary explosives, propellants, and pyrothechnics. Specifically, photo-electronic initiation has been observed in lead and thallous azide. The effect has been characterized and interpreted in terms of the optical and electronic transport measurements on these materials. (Modified author abstract)

AD-775 580/4GA PC$13.00/MF$1.45
Department of Defense Explosives Safety Board Washington D C
MINUTES OF THE EXPLOSIVES SAFETY SEMINAR (15TH) HELD AT THE HYATT REGENCY HOTEL, SAN FRANCISCO, CALIF., 18-20 SEPTEMBER, 1973.. VOLUME I.
20 Sep 73, 747p
See also report dated 12 Feb 73, AD-758 990.

Descriptors: *Explosives, *Ammunition, *Safety, Storage, Containers, Weapons, Fire safety, Explosions, TNT, Packaging, Transportation, Explosion effects, Explosive ordnance disposal, Warheads, Symposia.
Identifiers: Hazardous materials.

The topics discussed at the seminar were mostly on storage, loading handling and disposal of explosives and ammunition, blast effects, impact sensitivity, shock initiation, detonation, nuclear explosions and safety engineering.

PATENT-3 745 877 Not available NTIS
Department of the Air Force Washington D C
INTERVALOMETER FOR PARACHUTE FLARE LAUNCHER.
Patent,
James J. Dobson, Thomas I.. Dellecave, Rudolf R. Konegen, and John R. Miller. Filed 22 Dec 71, patented 17 Jul 73, 16p Rept nos. PAT-APPL-210 871,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Intervalometers, *Patents, Parachute flares, Launching, Timing devices.
Identifiers: PAT-CL-89-28.

The patent relates to a control apparatus for automatically launching parachute flares from launchers which may be positioned in various different locations. The control apparatus which is located at a distance from the launchers contains the firing, timing and safety circuits necessary to launch the parachute flares in sequence.

PATENT-3 749 022 Not available NTIS
Department of the Air Force Washington D C
TWO-STAGE ARMING MECHANISM.
Patent,
Charles W. Lindberg. Filed 14 Oct 71, patented 31 Jul 73, 6p Rept nos. PAT-APPL-189 284,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Arming devices, *Patents, Bombs, Fuze functioning elements, Rotors, Spinning(MOTION).
Identifiers: PAT-CL-102-79.

The patent relates to a two-stage arming mechanism for a spin-to-arm munition. This arming mechanism contains two arming means therein which must be activated in sequence in order to fully arm the mechanism. The first means is actuated by spin velocity, while the second means is activated by angular deceleration which occurs during ground impact. Unless both conditions are met in the proper sequence the arming mechanism will not fully arm.

19D. Explosions, Ballistics, and Armor

AD-774 765/2GA PC$3.75/MF$1.45
Stanford Research Inst Menlo Park Calif
SENSITIVITY FUNDAMENTALS.
Semiannual technical progress rept. 1 Sep-31 Dec 73,
Marion E. Hill, Theodore Mill, David S. Ross, Robert Shaw, and C. Tarver. Feb 74, 72p Rept no. SRI-TPR-73-3
Contract N00014-70-C-0190
See also report dated Oct 73, AD-769 114.

Descriptors: *Liquid explosives, *Detonations, Decomposition, Catalysis, Sensitivity, Reaction kinetics, Pyrolysis, Explosions, Chemical structure, Organic nitrogen compounds, Nitromethane, Deuterium compounds, Pressure.
Identifiers: *Nitro compounds, Low velocity detonations, High velocity detonations, Propane/dinitro, Isotope effect, Chemical reaction mechanisms.

The report summarizes a six-month period of research on the relationship between detonation phenomena, chemical structure, and kinetics for dinitroalkanes, sponsored by the Office of Naval Research. Research on dinitroalkanes is being carried out in two areas: high velocity detonation (HVD), low velocity detonation (LVD), and static high pressure and kinetic effects. Notes on a visit by the Soviet detonation expert A. N. Dremin are included. (Modified author abstract)

AD-774 805/6GA PC$4.75/MF$1.45
Army Mobility Equipment Research and Development Center Fort Belvoir Va

ANALYTICAL STUDY OF ARMY DEMOLITION FORMULAE,
George W. Walder. Aug 73, 129p Rept no. USAMERDC-2072

Descriptors: *Girder bridges, *Demolition, *Prestressed concrete, Demolition charges, High explosives, Reinforced concrete, Structural steel, Wood, Structural members, Cutting.

An analytical study was performed using experimental test data realized from 8 years of previous demolition programs conducted by USAERDL/USAMERDC, Fort Belvoir, VA. Data which were analyzed related to the demolition of prestressed concrete bridge members, the cutting of steel structural elements, and the cutting of standard timber. The formulae developed from the experimental data are compared to the formulae and relationships contained in FM5-25, Explosives and Demolition, February 1971. (Author)

AD-774 866/8GA PC$4.50/MF$1.45
Naval Weapons Lab Dahlgren Va
CALCULATION OF 5 INCH/54 MUZZLE BLAST AND POST EJECTION ENVIRONMENT ON PROJECTILE.
Technical rept.,
G. R. Moore, F. H. Maillie, and G. SooHoo. Jan 74, 111p Rept no. NWL-TR-3000

Descriptors: *Gun barrels, *Blast, Projectiles, Flow fields, Overpressure, Naval guns, Mathematical models, Exterior ballistics.

Two methods were used to introduce a projectile into the flow field from the muzzle of a 5 inch/54 gun. The first method employed a barrel fixed coordinate system, the second employed a projectile fixed coordinate system. Calculations were made using both methods for a 5 inch/54 gun blast, and the results were compared. The blast field without a projectile present was also calculated. All Calculations were carried out using a version of the one-material axisymmetric SHELLTC hydrodynamic code using a digital computer. (Modified author abstract)

AD-774 880/9GA PC$4.50/MF$1.45
Naval Weapons Lab Dahlgren Va
THE DEVELOPMENT OF A 'HARD-WIRE' TECHNIQUE FOR OBTAINING IN-BORE DATA.
Technical rept.,
W. Dale Craig. Nov 73, 29p Rept no. NWL-TR-3060

Descriptors: *Gun barrels, *Projectiles, *Interior ballistics, Gun launchers, Probes.
Identifiers: *In bore measurements.

An instrumentation system has been developed which is capable of obtaining high frequency response data from a projectile during gun launch. The system uses a 'hard-wire' technique to provide a direct recording path from an instrumented projectile. The technique has been used many times and has proven to be very reliable. A one-channel, and a two-channel system have been designed and tested which can be used with various projectiles. Data recorded using these systems agrees well with theoretical calculations. (Modified author abstract)

AD-774 997/1GA PC$5.00/MF$1.45
Shock Hydrodynamics Sherman Oaks Calif
PREDICTION CALCULATIONS FOR THE MIXED COMPANY III EVENT.
Topical rept.,
Gilberto Ialongo. 20 Nov 73, 153p DNA-3206T
Contract DNA001-72-C-0009

Descriptors: *Cratering, *Rock mechanics, *Soil mechanics, *Explosion effects, TNT, Mathematical prediction, Nuclear explosions, Simulation, Sandstone, Granite, Silt, Ejecta, Stresses, Ground motion, Shock waves, High explosives, Hydrodynamics, Lagrangian functions, Colorado. Identifiers: Mixed company 3 shot, Grand Junction(Colorado), Hugoniot data.

Mixed Company III is a surface tangent burst of 500 tons of TNT conducted November 13, 1972 at Grand Junction, Colorado. The site geology consists of a layer of clayey silt approximately five feet thick over layers of sandstone resting on granite bedrock. The primary objective of Shock Hydrodynamics' effort in support of the Mixed Company program was the preshot calculation of the cratering and ejecta phenomena accompanying this shot. The calculation and comparison of predicted ground motion at points selected to correspond to field measurement stations was another objective.

AD-775 019/3GA PC$5.50/MF$1.45
Naval Postgraduate School Monterey Calif
HYDRAULIC RAM STUDIES.
Master's thesis,
Wesley Richard Soper. Dec 73, 50p

Descriptors: *Fuel tanks, *Terminal ballistics, Penetration, Impact shock, Yield strength, Energy transfer, Dynamic pressure, Theses, Computer programs.
Identifiers: *Hydraulic ram effect.

Hydraulic ram concerns catastrophic failure of liquid filled tanks impacted by high speed projectiles. It is divided into four phases: entry/shock, pressure field, cavity, and free surface. The entry wall phase was investigated in detail. A formula to predict energy losses of a bullet penetrating an aluminum plate is presented, and experimental data were obtained and compared. A fiber optic transducer wad designed to measure generated pressures in the shock and cavity phases. (Author)

AD-775 097/9GA PC$4.75/MF$1.45
Mcgill Univ Montreal (Quebec) Dept of Mechanical Engineering
THE PROPAGATION OF NONIDEAL BLAST WAVES.
Interim rept.,
Christiane M. Guirao, John H. Lee, and Glen G. Bach. Jan 74, 35p Rept no. MERL-74-1 AFOSR-TR-74-0187
Grant AF-AFOSR-2387-72
Presented at the Conference on the Mechanism of Explosion and Blast Waves, Yorktown, Va., 13-15 Nov 73.

Descriptors: *Blast, *Shock waves, Wave propagation, Flow fields, Shock spectra, Hydrodynamics, Canada.

The propagation of non-ideal blast waves initiated by finite power density sources has been classified into three regimes. The early-time motion of a non-ideal blast reflects the characteristics of the energy-time profile of the particular initiation energy source. In the intermediate-time propagation regime, the flow field in the neighborhood of the shock front progressively forgets the non-idealities of the initiation source. In the late-time or asymptotic regime, the shock hydrodynamics of non-ideal blast waves approaches that of ideal blasts with counterpressure effects. It is also found that energy scaling with respect to the explosion length exists for the present, non-ideal blast waves generated by an impulsive piston. (Author)

AD-775 127/4GA PC$4.25/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
SHOCK WAVES IN SOILS AND IN WATER NEAR THE EXPLOSION SITE,
G. M. Lyakhov, V. N. Okhimin, and A. G. Chistov. 1 Feb 74, 21p Rept no. FTD-HT-23-386-74
Edited trans. of Zhurnal Prikladnoi Mekhaniki i Tekhnicheskoi Fiziki (USSR) n3 p151-159 1972, by Marilyn Olaechea.

Descriptors: *Explosions, *Ground motion, Translations, Shock waves, Explosion effects, Water waves, Soils, Computerized simulation, USSR.

The problem of a plane shock wave propagating in soils and in water is solved. The solution was obtained by means of the characteristic method on the electronic computer. In this case soils are regarded as multicomponent media in keeping with an earlier proposed model. Compared are the parameters of the waves and the dimensions of gas chambers in soils with different concentrations of components and in water.

AD-775 129/0GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
PLANE, CYLINDRICAL AND SPHERICAL EXPLOSIONS IN DETONATING GAS WITH COUNTERPRESSURE,
E. Bishimov. 4 Feb 74, 12p Rept no. FTD-HT-23-826-74
Edited trans. of Akademiya Nauk Kazakhskoi SSR, Alma-Ata. Izvestiya. Seriya Fiziko-Matematicheskikh Nauk, v8 n1 p43-48 1970, by Bernard L. Tauber.

Descriptors: *Gases, *Explosions, Detonations, Detonation waves, Numerical analysis, Translations, USSR.

In the initial stage when the blast wave is still sufficiently strong the problem of a point explosion, taking account of the energy of combustion and counterpressure, is solved by the method of linearization near a known self-similar solution.

AD-775 158/9GA PC$3.75/MF$1.45
Air Force Rocket Propulsion Lab Edwards AFB Calif
BLAST HAZARDS OF CO/N2O MIXTURES.
Interim rept. Jan-Sep 73,
Charles R. Mastromonico, and Forrest S. Forbes. Sep 73, 53p Rept no. AFRPL-TR-73-89

Descriptors: *Carbon monoxide, *Explosions, Propellants, Hazards, Detonations.
Identifiers: Nitrogen oxide(N2O).

A preliminary investigation into the explosion hazards associated with vapor and condensed phase mixtures of carbon monoxide (CO) and Nitrous Oxide (N2O) has been accomplished at the Air Force Rocket Propulsion Laboratory. Quantities of CO and N2O, ranging from 50 to 850 pounds, were combined in unconfined and semi-confined configurations and exploded using No. 8 blasting caps supported by a squib as the initiator. The configurations incorporated in the test matrix were designed to reproduce the variety of mixing modes that the two propellants would experience were they to escape, due to line or component failure, from a closed system into a test cell. Peak overpressures were measured as a function of time and distance from the explosion site. (Modified author abstract)

AD-775 256/1GA PC$4.50/MF$1.45
Geo-Fracturing Inc El Paso Tex
EXPLOSIVE LOADING OF A DEFORMABLE UNDERWATER STRUCTURE.
Final rept.,
Richard Collins. Jan 74, 105p Rept no. GF-74-1
Contract N00014-73-C-0135

Descriptors: *Underwater structures, *Underwater explosions, Shells(Structural forms), Structural response, Detonation waves, Stress strain relations, Computerized simulation, Explosion effects, Finite difference theory.
Identifiers: HEMP computer code, CDC 7600 computers.

The full HEMP numerical code, modified to permit an enlarged memory, has been used on the CDC 7600 computer to calculate the complete field

solution for the loading of submerged thin shell structures, of cylindrical and spherical geometries, due to a nearby intense underwater explosion. No exact theoretical solution exists for the propagation of strong nonlinear waves past such deformable structures. However, the acoustic case has been solved analytically by Mnev and Pertsev (1971), providing a direct comparison with supplementary calculations with the HEMP code for an acoustic wave emanating from a weak explosion. Agreement with the acoustic solution is quite satisfactory. The particular application described in this work to nonlinear fluid-shell interaction problems holds the promise of significant advances in structural design which have heretofore been limited to loading levels corresponding to weak explosive waves in the linear acoustic range. (Author)

AD-775 422/9GA PC$3.75/MF$1.45
Picatinny Arsenal Dover N J
CALCULATION OF TNT AIR-BLAST EQUIVALENCIES FOR SURFACE BURSTS.
Technical rept.,
Thomas Caggiano. Dec 73, 52p Rept no. PA-TR-4567

Descriptors: *TNT, *Airburst, *Surface burst, Blast, Scaling factors, Pressure, Safety, Mathematical models, Computer programs, FORTRAN.
Identifiers: *Quantity distance equivalencies.

TNT air-blast standards for hemispherical explosive charges (scaled positive unit impulse and peak pressure vs scaled distance) are presented in graphical and tabular forms. Equations for positive unit impulse and peak pressure TNT equivalencies are derived, permitting rapid manual calculation. The equivalencies relate the weight ratio of TNT to the sample material in terms of their relative explosive airblast. The calculation of TNT equivalencies will facilitate and expedite the efficient, reliable establishment of intraline distances in production facilities and loading plants. A FORTRAN Extended computer program with complete documentation and sample input and output is included in this study. (Author)

AD-775 456/7GA PC$5.50/MF$1.45
Ballistic Research Labs Aberdeen Proving Ground Md
BLAST LOADING OF OBJECTS IN BASEMENT SHELTER MODELS.
Memorandum rept.,
George A. Coulter. Jan 74, 176p Rept no. BRL-MR-2348

Descriptors: *Shelters, *Model tests, *Blast loads, *Civil defense, Shock waves, Overpressure, Computer programming, Mathematical prediction, Velocity, Cylindrical bodies, Scale.
Identifiers: Basement shelters.

Experimental results obtained from loading two 1/12th scale basement shelter models are given for 80 and 1000 shelteree size shelters. The models were exposed to shock waves in the 5 to 20 psi overpressure range. Computer program predictions of air speeds and pressure filling are compared to the measured motion of nylon cylinders placed within the shelter models. (Author)

AD-775 458/3GA PC$3.25/MF$1.45
Ballistic Research Labs Aberdeen Proving Ground Md
EFFECT OF STRONG BLAST WAVE ON A DUST-LADEN GAS,
Nathan Gerber, and Joan Bartos. Jan 74, 33p Rept no. BRL-1696

Descriptors: *Blast, *Dust, Trajectories, Mechanical waves, Particles, Flow fields, Two phase flow.

A uniform gas at rest contains a suspension of dust particles; a spherical blast sets these particles in motion as it travels through the gas. The objective is to determine the motion of the dust particles. Two basic assumptions are employed in the approximate description of the phenomenon: the interaction between particles can be neglected so that only the drag force acting on the particle is considered; the Taylor-Sedov point blast theory describes the flow field. The calculations which are performed for dust particle trajectories make use of the latest available empirical data for drag force. A further simplified model of the two-phase flow enables one to obtain analytical predictions which agree qualitatively with results of the exact computations. (Modified author abstract)

N74-15288/5GA PC$3.00/MF$1.45
Office National d'Etudes et de Recherches Aerospatiales, Toulouse (France). Dept. d'Etudes de Recherches en Technologie Spatiale.
IMPACT CRATERS INDUCED IN BRITTLE MATERIALS CRATERES D'IMPACT PRODUITS SUR DES MATERIAUX FRAGILES.
J. C. Mandeville. 1973, 16p ONERA-DERTS-NT-01-16
Language in French.

Descriptors: *Brittle materials, *Hypervelocity impact, *Projectile cratering, *Terminal ballistics, Basalt, Borosilicate glass, Granite, Kinetic energy, Mass transfer, Propagation velocity, Scale effect.

For abstract, see STAR 1206

19E. Fire Control and Bombing Systems

AD-775 360/1GA PC$4.50/MF$1.45
Mcdonnell Aircraft Co St Louis Mo
AIR-TO-AIR FIRE CONTROL EXPOSITION. PHASE III (EXPO III).
Final rept. May 72-Jan 73,
Robert L. Berg, and Michael M. Sears. Sep 73, 118p AFAL-TR-73-287
Contract F33615-72-C-2046

Descriptors: *Aircraft fire control systems, *Aerial gunnery, Air to air, Gun sights, Man machine systems, Avionics, Flight simulators, Computerized simulation.
Identifiers: Computer graphics.

The Air-to-Air Fire Control Exposition (EXPO) Program, which has as its goal investigate fire control system concepts for use in advanced fighter aircraft, was continued as a Phase 3 effort. The objectives of this follow-on phase were to model and program combined fire control system approaches (which included that of an associated participant) to the air-to-air gunnery problem, model and implement degraded sensor inputs to the fire control system models, provide capability for investigation of high velocity ammunition, and to define a test plan for a flight simulator optimization and evaluation of the fire control systems in a subsequent program phase. (Modified author abstract)

19F. Guns

AD-774 837/9GA PC$8.00/MF$1.45
Comprehensive Designers Inc Peoria Ill
LIMIT DIMENSIONAL STUDY OF THE M203 GRENADE LAUNCHER, M16, M16A1 RIFLES AND QUADRANT SIGHT COMBINATIONS.
Final rept.,
N. A. Vaidya, and L. M. Coup. 8 Jan 71, 362p AMSWE-RE-71-6
Contract DAAF01-70-A-0135-0035

Descriptors: *Rifles, *Gun sights, *Rifle grenade launchers, Alignment, Tolerances(Mechanics), Engineering drawings, Minimax technique, Fitting functions(Mathematics).
Identifiers: M-16 guns(5.56-MM), M-16A1 guns(5.56-MM), M-203 grenade launchers, Quadrant sights.

The report is a limit study of the dimensions of the Quadrant Sight when mounted and references to the M16/M16A1 Rifle. (Author)

AD-775 020/1GA PC$6.75/MF$1.45
Naval Postgraduate School Monterey Calif
VELOCITY, KINETIC ENERGY, AND PRESSURE DEVIATIONS RESULTING FROM THE ADAPTATION OF A SECONDARY PROPELLANT CHAMBER ON A 30-06 RIFLE BARREL.
Master's thesis,
Charles Carmen Failla. Dec 73, 74p

Descriptors: *Gun barrels, *Rifles, *Muzzle velocity, Interior ballistics, Ammunition propellants, Ignition, Pressure, Kinetic energy, Theses, Computer programs.

A secondary chamber was adapted to a 30-06 pressure barrel as a means for increasing muzzle velocity without exceeding the barrel pressure rating. Ignition of the secondary charge was accomplished by the high pressure gases behind the bullet. Resulting muzzle velocities were determined for various amounts of three granular and one liquid propellant. Pressure-time curves were obtained for one of the faster burning powders. Adiabatic bomb calorimeter testing and published data were used to determine the heats of combustion. The data suggested that the rate of energy release, and not the heat of combustion, was the dominant factor. The results also indicated that a more optimum location of the secondary charge was possible. (Modified author abstract)

AD-775 394/0GA PC$6.75/MF$1.45
Emerson Electric Co St Louis Mo Electronics and Space Div
DEVELOPMENT AND TEST OF STORAGE AND FEED SYSTEM FOR GAU-7/A GUN.
Final rept. Mar 71-Jan 72,
H. Williams, and K. Gilbert. Jun 72, 71p AFATL-TR-72-108
Contract F33657-71-C-0829

Descriptors: *Aircraft guns, *Ammunition feed mechanisms, *Jet fighters, Caseless ammunition, Loaders, Sprockets, Storage, Firing tests(Ordnance), Simulation, Optimization.
Identifiers: GAU-7 guns(25mm), F-15 aircraft.

The report provides a description of the design and a summary of the test results of the 25mm Caseless Ammunition Storage and Feed System developed for the F-15 aircraft. Section 2, supplemented by Appendix 1, gives a functional description of the system and its operation. The manner in which the system design accommodated the differences in direction of rotation, round size, feed interruption, power take-off, control, and physical interface of the two guns is included in the description. Section 3 summarizes the results of the tests performed by the Air Force Armament Test Laboratory at Eglin Air Force Base, Florida, using a gun simulator. Section 4 summarizes the gun firing tests conducted with the General Electric GAU-7/A gun at Burlington, Vermont.

AD-775 447/6GA PC$4.00/MF$1.45
Army Test and Evaluation Command Aberdeen Proving Ground Md
INSPECTIONS AND MEASUREMENTS OF CANNON.
Final rept. on test operations procedure.
20 Dec 73, 11p Rept no. TOP-3-2-800
Supersedes Rept. no. MTP-3-2-800, AD-718 709.

Descriptors: *Guns, *Test methods, Inspection, Breech mechanisms, Radiography, Ultrasonics, Measurement.
Identifiers: *Common engineering test procedures.

The document provides an outline of inspection and measurement procedures for cannon; and prescribes inspection frequency and condemnation criteria for cannon components (tube breech

rings, breechblocks, breech/chamber and couplings, mortar basecaps, and recoilless rifle vent assemblies). It provides references for techniques including use of star gage, pullover gage, and borescope; impressions and casts of bores; and magnetic particle, magnetic recording borescope, radiographic, ultrasonic, and liquid penetrant inspections. The document applies to large caliber guns, howitzers, mortars, and recoilless rifles.

AD-775 478/1GA PC$3.25/MF$1.45
Maremont Corp Saco Maine New England Div
XM129 40MM GRENADE LAUNCHER BARREL IMPROVEMENT PROGRAM.
Final technical rept.
22 Feb 74, 37p
Contract DAAF03-73-C-0140

Descriptors: *Grenade launchers, *Gun barrels, Rifling, Wear, Erosion, Firing tests(Ordnance), Life tests.
Identifiers: M-129 grenade launchers(40-MM), XM-129 grenade launchers(40-MM), Steel H-11, Steel 4340.

Various materials, coatings and mechanical changes to improve barrel life were previously tested and evaluated. It was concluded by that effort that one of the materials tested, H-11 tool steel, showed promise of significantly extending the average service life of the XM129 40mm barrel and it was recommended that additional testing be accomplished. The objective of the scope of work was to fabricate one hard chrome plated H-11 alloy barrel and test fire it a total of 15,000 rounds or until the barrel was declared unserviceable. In addition, test firing of barrel no. H-1 of H-11 material from the previous contract would continue until 15,000 rounds or it became unserviceable. The test firing was to be conducted in accordance with the schedule approved for the first contract. This work has been completed, the barrels have been sectioned and examined and the findings are presented in the report.

19G. Rockets

AD-774 845/2GA PC$7.50/MF$1.45
Army Missile Command Redstone Arsenal Ala Ground Equipment and Materials Directorate
VIBRATION ABSORBERS FOR ROCKET LAUNCHERS MOUNTED ON HELICOPTERS: ANALYTICAL ANALYSIS AND IMPLEMENTATION TECHNIQUES.
Technical rept.,
C. D. Johnson. 2 Jan 74, 87p Rept no. RL-TR-74-1

Descriptors: *Rocket launchers, *Vibration isolators, Dynamic response, Helicopters, Damping, Numerical analysis, Servomechanisms, Gun mounts.

An analytical analysis of the dynamical behavior of the tuned-mass vibration absorber is presented, and the notion of optimum damping is introduced. Computational techniques for calculating optimum damping coefficients are developed and three representative numerical examples are solved. A nonlinear servo-control system is designed to achieve inflight automatic tuning of the tuned-mass absorber in the face of varying helicopter rotor speeds. The practical aspects of implementing active vibration absorbers are studied and some specific circuits and hardware schemes are proposed. A spring-linkage (parallelogram) mount, a cantilever-wing tuned-mass absorber, and an active absorber are designed for implementation and testing on a full scale mock-up of a Cobra helicopter wing. (Modified author abstract)

AD-775 377/5GA PC$6.25/MF$1.45
Army Missile Command Redstone Arsenal Ala Ground Equipment and Materials Directorate
MODAL RESPONSE OF FREE ROCKETS UNDER THRUST LOADING.
Technical rept.,
H. B. Wilson, and J. J. Richardson. 14 Jan 74, 64p Rept no. RL-TR-74-2

Descriptors: *Rockets, Free flight trajectories, Bending, Frequency, Timoshenko beam, Computerized simulation, Computer programs.
Identifiers: Thad missiles, Thad T-6 missiles, Finite element analysis, VAALR computer program.

In the report an analysis yielding the modal responses of a rocket, constrained or in free flight, is presented. The effects of a tangential end thrust are considered as are the influences of shear and structural joints. The modelling was accomplished by employing the finite element technique. The resulting program, called Vibration Analysis of an Axially Loaded Rocket (VAALR), is discussed and a section on user procedures is included. Examples are offered to aid the engineer in data card preparation. The results of parameter studies are considered to offer some suggestions in modelling. Among the parameter studies is an analysis of the THAD T-6 missile. (Author)

19H. Underwater Ordnance

AD-774 910/4GA PC$3.25/MF$1.45
Naval Ordnance Lab White Oak Md
AXISYMMETRIC ELASTIC DEFORMATIONS AND STRESSES IN ORTHOTROPIC SANDWICH CYLINDERS UNDER UNIFORM EXTERNAL HYDROSTATIC PRESSURE.
Final rept.,
M. B, Moore, III. 14 Nov 73, 29p Rept no. NOLTR-73-168

Descriptors: *Underwater ordnance, *Sandwich construction, *Shells(Structural forms), Hydrostatic pressure, Aluminum alloys, Strength weight ratio, Graphite, Composite materials, Deformation, Stresses.
Identifiers: *Sandwich cylinders, Aluminum alloy 6061.

Equations describing the stresses in orthotropic sandwich cylinders under hydrostatic pressure are derived. These equations are used to plot design curves for these cylinders in a range of diameters from 13 inches to 25 inches and up to an applied pressure of 10,000 psi. Double wall composite sandwich cylinders are compared to cellular sandwich shells fabricated from aluminum and to conventional rib-stiffened cylinders. Finally, sandwich cylinders fabricated with 'S' glass facings and graphite facings are compared. (Author)

AD-775 003/7GA PC-GPO/MF$1.45-NTIS
Naval Ordnance Lab White Oak Md
MINES AGAINST JAPAN,
Ellis A. Johnson, and David A. Katcher. 1974, 303p
Availability: Paper copy available from GPO $6.95 stock number 0856-00038.

Descriptors: *Mine warfare, *Pacific Ocean, Japan, Minelaying, Mine countermeasures, Minesweeping, Naval mines, Aerial mines, History.
Identifiers: World War 2, Pacific theater.

Contents:
- Mines before World War II;
- Sea blockade from the air;
- Summary of mining operations and results;
- Mine policy during World War II;
- Staff aspects of mining operations;
- Outer zone operations;
- Inner zone operations;
- Tactics of inner zone campaign;
- Requirements for new mines;
- The problem of countermeasures;
- Problems in the development of new weapons.

20. PHYSICS

20A. Acoustics

AD-774 794/2GA PC$8.25/MF$1.45
Lockheed-Georgia Co Marietta
V/STOL NOISE PREDICTION AND REDUCTION.
Final rept. Jun 72-Aug 73,
W. A. Guinn, D. F. Blakney, and J. S. Gibson. Aug 73, 396p Rept no. LG73ER0062 FAA-RD-73-145
Contract DOT-FA72WA-3099

Descriptors: *Short takeoff aircraft, *Jet plane noise, Bibliographies, Jet engine noise, Noise reduction, Aerodynamic control surfaces, Aerodynamic noise, Computer programs, Mathematical prediction.
Identifiers: *Blown flaps, *Noise sources.

A four-phase program is described. Phase 1 was concerned with the identification of noise sources in rotary and jet stream type propulsion systems for V/STOL aircraft. In order to facilitate the noise source identifications and provide needed data for subsequent work, an extensive bibliography (809 references) was compiled. Phase 2 work covers the definition of noise generating mechanisms for jet stream V/STOL systems. Phase 3 discusses the noise reduction concepts which are applicable. In Phase 4, hand calculation and computer programs are derived and presented for predicting the far field noise environment of various types of V/STOL aircraft. (Author)

AD-774 978/1GA Reprint
Massachusetts Inst of Tech Cambridge Research Lab of Electronics
UPSTREAM AND DOWNSTREAM SOUND RADIATION INTO A MOVING FLUID,
Uno Ingard, and Vijay K. Singhal. 1 Jun 73, 6p
Contract N00014-67-A-0204-0019
Availability: Pub. in Jnl. of the Acoustical Society of America, v54 n5 p1343-1346 1973.

Descriptors: *Sound transmission, *Fluid flow, Mathematical analysis, Mach number, Wave equations.

An experimental demonstration of the influence of fluid motion in a duct on the sound pressure field radiated in the upstream and downstream directions from a stationary sound source is presented. The measured ratio between the upstream and downstream sound pressure amplitudes in the duct is presented as a function of the flow Mach number in the range M = 0-0.5. The results are discussed in the light of a mathematical analysis of the problem. (Author)

AD-775 224/9GA PC$4.25/MF$1.45
Maryland Univ College Park Dept of Mechanical Engineering
THE DYNAMIC RESPONSE OF A PROLATE SPHEROIDAL SHELL SUBMERGED IN AN ACOUSTIC MEDIUM,
B. S. Berger. Feb 74, 22p
Contract N00014-67-A-0239-0020

Descriptors: *Underwater sound, *Spheres, *Loads(Forces), Acoustic scattering, Finite difference theory, Wave functions, Numerical analysis, Underwater objects.

A finite difference solution to the problem of the dynamic response of a spheroidal shell, based on Sander's theory, surrounded by an acoustic medium has been formulated for arbitrary loading in terms of time and space. The solution is based on a technique for introducing acoustic shell interaction effects into a program for the response of the shell in vacuo, which may be applied to a wide variety of such programs with a minimum of reprogramming. Numerical results or the sphere and spheroid demonstrate the validity of the approach.

AD-775 286/8GA PC$3.25/MF$1.45
Naval Underwater Systems Center Newport R I
COMPARATIVE EFFICIENCIES OF NUMERICAL TECHNIQUES IN THE SOLUTION OF ACOUSTIC WAVE PROBLEMS: A COMPUTER EXPERIMENT.
Technical rept.,
J. C. Hassab, and P. H. Fredette. 1 Feb 74, 22p
Rept no. NUSC-TR-4476

Descriptors: *Underwater sound, *Acoustic waves, *Computer applications, Microstructure, Refractive index, Wave equations, Matrices(Mathematics), Computations, Efficiency, FORTRAN.

Comparisons are made between classical numerical techniques, or algorithms, and a newly developed technique, which is tailored to the solution of acoustic wave problems in layered structures. Results of extensive computer experimentation show that the presently advanced technique is more efficient than the existing techniques that may be applied in the presence of arbitrary profiles. Reductions in solution times roughly proportional to the matrix size, N, when compared to the Gauss elimination technique, and twice the iteration number when compared to the Gauss-Seidel technique are observed. In addition, the present technique reduces the storage requirements by nearly one half and increases the numerical by a factor of two. In many at-sea explorations and missions, real-time acoustic predictions are essential for in-situ decision making. Being highly efficient, this new technique should be particularly desirable. (Author)

AD-775 562/2GA Reprint
Wisconsin Univ Madison Geophysical and Polar Research Center
ERROR ANALYSIS OF VELOCITY AND DIRECTION MEASUREMENTS OF PLANE WAVES USING THICK LARGE-APERTURE ARRAYS,
C. S. Clay, M. J. Hinich, and P. Shaman. 14 Feb 72, 7p
Contract N00014-67-A-0128-0009
Prepared in cooperation with Carnegie-Mellon Univ., Pittsburgh, Pa. Dept. of Statistics.
Availability: Pub. in The Jnl. of the Acoustical Society of America, v53 n4 p1161-1166 1973.

Descriptors: *Acoustic waves, *Plane waves, Antenna apertures, Signal processing, Statistical analysis.
Identifiers: Maximum likelihood estimation, Error analysis.

The statistical properties of estimators for plane-wave parameters are discussed. A thick large-aperture array is assumed to be detecting a signal emanating from an unknown continuous wave source. The signal is assumed to be a plane wave embedded in a spatially incoherent Gaussian noise field. Maximum-likelihood estimators of velocities and directions are derived and their root-mean-square errors are obtained, for single and multiple arrivals for linear arrays and square arrays with a large number of sensors. (Modified author abstract)

AD-775 566/3GA Reprint
Woods Hole Oceanographic Institution Mass
TRANSMISSION AND RECEPTION OF TRANSIENT SIGNALS IN A SOFAR CHANNEL.
Technical rept.,
Robert P. Porter. 30 Apr 73, 15p Rept nos. WHOI-74-12, WHOI-Contrib-3094
Contract N00014-70-C-0205
Availability: Pub. in The Jnl. of the Acoustical Society of America, v54 n4 p1081-1091 1973.

Descriptors: *Underwater sound, *Sound transmission, Transmission loss, Underwater sound signals, Signal processing.
Identifiers: Sofar, WKB approximation.

The time-frequency structure of wide-band pulses propagated to long ranges in a deep sound channel is investigated with normal-mode theory. The WKB approximation is used to predict the pressure field in channel with arbitrary sound-velocity profiles. The pressure field due to nondispersive pulses such as the impulse and such as the linear-FM signal is calculated. The time-frequency structure of the field is compared with experiment. Observation of combined ray and mode behavior is predicted in a straightforward manner. The response of signal-processing receivers to the sound field is investigated for matched and nondispersive filters. The peak output of the matched filter is shown to be the weighted sum of the energies in each of the transmitted modes. (Author)

AD-775 567/1GA PC$3.25/MF$1.45
Honeywell Inc Seattle Wash Marine Systems Div
HARP III PROGRAM.
Annual technical rept.,
Robert L. Swarts. 3 Jan 74, 44p Rept no. 2596
Contract N00014-73-C-0399

Descriptors: *Underwater sound, *Sonar signals, *Acoustic scattering, *Ocean surface, Surface roughness, Sea states, Mathematical models, Plane waves.

The application of underwater acoustics to target detection and classification, communications, environmental measurement, resource evaluation, and other activities demands that one have an accurate tool for predicting how the signals of interest will be scattered from the sea surface. A critical review of two particularly successful models and the problems and shortcomings inherent to both is included in the report.

AD-775 568/9GA PC$3.75/MF$1.45
Honeywell Inc Seattle Wash Marine Systems Div
SPECTRAL CHARACTERISTICS OF BISTATIC SURFACE SCATTER.
Technical rept. Jun-Dec 73,
Robert L. Swarts. 6 Feb 74, 52p Rept no. 2620
Contract N00014-73-C-0399

Descriptors: *Underwater sound, *Acoustic scattering, *Ocean surface, Surface roughness, Sea states.

The results of an experimental program designed to measure the spectral characteristics of underwater bistatic surface scatter as a function of sea state and geometry are presented. The sea states examined were all small but because of the short acoustic wavelength the square of the Rayleigh parameter ranged from 4.45 to 108.1 with all but one of the measurements in the 'very rough' regime. Both specular and off-specular data were collected. A plane wave theoretical model was used heuristically to indicate the trends to be expected in the data. It was found that, in general, the plane wave model did not adequately predict the results although in certain special circumstances its results were accurate. Areas requiring additional effort are discussed. (Author)

N74-15485/5GA PC$3.50/MF$1.45
National Aerospace Lab., Tokyo (Japan).
DISTORTIONS OF SONIC BOOM PRESSURE SIGNATURE BY SOUND AND TURBULENCE INTERACTION.
N. Kono. 1973, 28p NAL-TR-334
In Japanese; English Summary.

Descriptors: *Atmospheric turbulence, *Eddy currents, *Pressure distribution, *Sonic booms, Acoustic scattering, Circular cylinders, Scatter propagation, Turbulent wakes.

For abstract, see STAR 1206

20B. Crystallography

AD-774 895/7GA PC$3.75/MF$1.45
Boeing Co Seattle Wash
THE STRUCTURE OF NON-CRYSTALLINE MATERIALS.
Final rept. 4 Feb 71-31 Dec 73,
Farrel W. Lytle. 31 Dec 73, 62p
Contract DAHC04-71-C-0010, ARPA Order-1562
See AD-766 139.

Descriptors: *Semiconductors, *Amorphous materials, *Crystal structure, X ray absorption analysis, Germanium compounds, Arsenic compounds, Selenides, Sulfides, Tellurides.
Identifiers: *Amorphous semiconductors, *Germanium selenides, *Arsenic selenides, *Arsenic sulfides, *Arsenic tellurides.

The primary purpose of this research was to develop the phenomenon of extended x-ray absorption fine structure (EXAFS) as a technique for investigating the structure of non-crystalline materials, particularly amorphous semiconductors. The EXAFS work on amorphous semiconductors was continued on GeSe, GeSe2, As2Se3, As2S3, and As2Te3. Accompanying this final report are three papers describing the EXAFS experimental and data analysis techniques.

AD-774 949/2GA Reprint
Polytechnic Inst of Brooklyn N Y Dept of Physics
6-BEAM BORRMANN DIFFRACTION,
T. C. Huang, M. H. Tillinger, and Ben Post. 1 Feb 73, 7p
Contract N00014-67-A-0438-0005
Availability: Pub. in Zeitschrift fuer Naturforschung, v28a n5 p600-603 1973.

Descriptors: *Crystal structure, *X ray diffraction, *Germanium, Crystal lattices.

Linear absorption coefficients and transmitted intensities have been calculated for all twelve modes of propagation in one case of 6-beam diffraction of x-rays through germanium. At the 6-beam point the absorption coefficients of four of the modes are less than 1/cm, using CuK alpha 1 radiation, compared with the 'normal' value of 352 1/cm; one third of the energy incident on the crystal at the exact 6-beam angle is allocated to these low absorption modes. (Author)

AD-774 959/1GA Reprint
Polytechnic Inst of Brooklyn N Y Dept of Physics
MULTIPLE BORRMANN DIFFRACTION,
Stephen Balter, Robert Feldman, and Ben Post. 4 Jun 71, 5p
Contract N00014-67-A-0438-0005
Availability: Pub. in Physical Review Letters, v27 n6 p307-310, 9 Aug 71.

Descriptors: *Crystal structure, *X ray diffraction, *Germanium, Crystal lattices.

High-resolution, divergent-beam x-ray diffraction photographs reveal previously unreported detail in multiple Borrmann (000), (111), (1,1,-1) reflections undergoing anomalous transmission through perfect germanium crystals. These have been accounted for satisfactorily using the plane-wave formulation of the dynamical theory of x-ray diffraction. (Author)

AD-775 045/8GA Reprint
Polytechnic Inst of Brooklyn N Y Dept of Physics
ABSORPTION AND EXCITATION IN MULTIPLE BORRMANN DIFFRACTION,
R. Feldman, and B. Post. 17 Mar 72, 4p
Availability: Pub. in the Physica Status Solidi A, v12 p273-276 1972.

Descriptors: *Germanium, *Crystal structure, *X ray diffraction, Crystal lattices, Excitation, Absorption(Physical), Theses.

A detailed study of the multiple Borrmann diffraction by the (111)/(1,1,-1) planes in germanium has been carried out. High resolution Laue photographs revealed previously unnoticed fine structure. Calculations of the excitations of modes of

propagation and of minimum absorption coefficients, as functions of theta, show satisfactory agreement with experimental results. (Author)

AD-775 165/4GA Reprint
Lehigh Univ Bethlehem Pa Dept of Metallurgy and Materials Science
INTERFACIAL SCREW DISLOCATIONS IN ANISOTROPIC TWO-PHASE MEDIA.
Interim rept.,
Y. T. Chou, and C. S. Pande. 1 Feb 73, 4p AFOSR-TR-74-0217
Grant AF-AFOSR-2326-72
Availability: Pub. in the Jnl. of Applied Physics, v44 n7 p3355-3356 Jul 73.

Descriptors: *Dislocations, *Stresses, Numerical analysis.

A simple analysis is presented of the elastic field of an interfacial screw dislocation in an anisotropic two=phase medium. Explicit expressions for the stress components of a single dislocation and of a dislocation wall are given. (Author)

AD-775 180/3GA Reprint
Polytechnic Inst of Brooklyn N Y Dept of Physics
EXPERIMENTAL METHODS FOR THE STUDY OF MULTIPLE BORRMANN DIFFRACTION,
T. C. Huang, and B. Post. 25 Sep 72, 5p
Contract N00014-67-A-0438-0005
Availability: Pub. in the Acta Crystallographica, vA29 pt1 p35-37 Jan 73.

Descriptors: *X ray diffraction, *Crystal structure, Germanium.

Relatively simple techniques using divergent unfiltered microbeam X-ray sources and large source-to-detector (film) distances, have been used to obtain detailed high-resolution photogarphs of regions of interest in reciprocal space. These photogtaphs reveal many previously unreported intensity anomalies. An example is given of a completely indexed photograph of forward direct beams transmitted through a perfect germanium crystal. Points of interest are discussed. (Author)

SLA-73-890 PC$3.50/MF$1.45
New Mexico Univ., Albuquerque (Usa). Bureau of Engineering Research.
EFFECT OF GROWTH PARAMETERS ON THE ELECTRICAL PROPERTIES AND CRYSTAL STRUCTURE OF HETEROEPITAXIAL SILICON ON SPINEL AND SAPPHIRE. TECHNICAL REPORT EE-207(73)SAN-254.
R. A. Colclaser. Aug 73, 30p
Contract 51-3475-I

Descriptors: (*Silicon, *Epitaxy), (*Sapphire, *Surface coating), Crystal growth, Films, Spinels, Substrates.

For abstract, see NSA 29 05, number 12481.

20C. Electricity and Magnetism

AD-775 171/2GA Reprint
Rochester Univ N Y Dept of Physics and Astronomy
NEW REPRESENTATIONS FOR MULTIPOLE MOMENTS AND ANGULAR SPECTRUM AMPLITUDES OF ELECTROMAGNETIC FIELDS.
Interim rept.,
A. J. Devaney, and E. Wolf. 8 Oct 74, 6p AFOSR-TR-74-0198
Grant AF-AFOSR-2150-72
Availability: Pub. in the Optics Communications, v9 n4 p327-330 Dec 73.

Descriptors: *Electromagnetic fields, Monochromatic light, Moments, Spectrum signatures.

New results are reported concerning the relationship between the multipole expansion and the angular spectrum plane-wave expansion of the electromagnetic field generated by a monochromatic localized charge-current distribution. An intimate connection between these two types of expansions is revealed. Based on these results, new source representations are obtained for the multipole moments and for the angular spectrum amplitudes. It is also shown how the field may be determined, at every point outside a sphere that contains the charge current distribution in its interior, from the knowledge of the radiation pattern. (Author)

AD-775 573/9GA PC$3.25/MF$1.45
Westinghouse Research Labs Pittsburgh Pa
SUPERCONDUCTING WINDINGS.
Annual rept. no. 1, 1 May-3 Dec 73,
Michael S. Walker, and John H. Murphy. 26 Feb 74, 31p Rept no. 74-9J2-CRYEL-R1
Contract N00014-73-C-0461
See also report dated 29 Nov 73, AD-770 602.

Descriptors: *Superconductors, *Coils, Composite materials, Losses, Alternating current, Hysteresis, Winding, Titanium alloys, Niobium alloys, Matrix materials, Copper alloys, Nickel alloys.

A schedule of the work accomplished under the program is presented with relevant discussion. Data and details are provided in Appendices. The loss behavior of superconductors was examined for alternating fields superimposed upon fixed bias fields simulating the field conditions that might be observed in a machine. An extensive set of measurments on one practical superconductor has been completed, and measurements on several other conductors have been initiated. A parallel effort has been sustained to extend the theory of losses under these field conditions. (Author)

PB-228 778/7GA PC$3.00/MF$1.45
Pennsylvania Univ., Philadelphia. Dept. of Mechanical Engineering and Applied Mechanics.
THE EFFECT OF ELECTRICAL CONDUCTIVITY VARIATIONS ON THE CHARACTERISTICS OF ARC DISCHARGES,
Alan M. Whitman, and Ira M. Cohen. Dec 73, 16p
MEAM-73-6 NSF-GK-2281/11
Grant NSF-GK-2281A

Descriptors: *Electric arcs, *Electric discharges, *Electrical resistance, Electric current, Electric potential, Numerical analysis.

Algebraically calculated current-voltage characteristics of arc discharges are obtained with a canal model for planar and cylindrical arcs and electrical conductivity given as a power of the heat flux potential. For slower than linear variation, the current-voltage characteristic has a distinct minimum whereas for faster than linear variation the arc electric field tends to zero as current increases without limit. (Author)

20D. Fluid Mechanics

AD-774 795/9GA PC$3.00/MF$1.45
California Univ Davis Dept of Mechanical Engineering
THREE DIMENSIONAL FLOW STUDIES OVER A SPINNING CONE AT ANGLE OF ATTACK.
Contract rept.,
H. A. Dwyer. Feb 74, 25p BRL-CR-137
Contract DAAD05-73-C-0039

Descriptors: *Conical bodies, *Spinning(Motion), *Three dimensional flow, *Angle of attack, Boundary layer, Magnus effect, Mathematical models, Equations of motion, Finite difference theory, Cross flow, Shear properties, Pressure gradients.

Calculation of the boundary layer induced Magnus force on a spinning cone is given. A new technique to calculate the laminar boundary layer flow over a spinning cone at small angles of attack has been developed, and has yielded the information needed to calculate the Magnus force. The results include both the centrifugal pressure gradient and crossflow wall shear contributions to the Magnus force, and also give the boundary layer displacement thicknesses. (Modified author abstract)

AD-774 861/9GA Reprint
Michigan Univ Ann Arbor Dept of Aerospace Engineering
MEASUREMENT OF THE MEAN PERIOD BETWEEN BURSTS,
S. S. Lu, and W. W. Willmarth. 27 Jun 73, 3p
Contract N00014-67-A-0181-0015
Prepared in cooperation with National Tsing-hua Univ., Taiwan (China). Revision of report dated 20 Mar 73.
Availability: Pub. in The Physics of Fluids, v16 n11 p2012-2013 Nov 73.

Descriptors: *Turbulent boundary layer, *Turbulence, Time, Sequential, Velocity, Correlation techniques, High pass filters, Taiwan.

The effect of a high pass filter on the measurements of the mean period between bursts is studied. The second mild maximum of the autocorrelation curve of the fluctuating streamwise velocity is not necessarily produced by bursting. (Author)

AD-774 886/6GA PC$3.00/MF$1.45
Naval Ship Research and Development Center Bethesda Md
SURVEY OF THERMOCLINES AND DRAG-REDUCTION PROPERTIES OF WATER IN THE MAJOR BASINS AT THE NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER,
N. Santelli. Nov 73, 23p Rept no. NSRDC-4089

Descriptors: *Stratification, *Model basins, Temperature, Thermoclines, Drag reduction, Test methods.

A systematic survey of temperature variation with depth was conducted in the David W. Taylor Model Basin (TMB) and the Maneuvering and Seakeeping (MASK) facilities at the Naval Ship Research and Development Center. Water samples from the basins were periodically tested for the presence of drag-reducing substances. A significant upper thermocline and an overall temperature gradient were found in the two basins of TMB. A weak, transient gradient was found in the seakeeping basin of MASK. No significant gradient could be found in the rotating-arm basin of MASK. Except for two highly transient occurrences in the drydock area of the rotating arm, none of the samples from the basins exhibited significantly lower drag. A tendency for slightly lower drag, 1% or less, was noted in the TMB basins. Precautions that are taken at the Center to prevent buildup of drag-reducing substances in the experimental facilities appear to be highly effective. (Modified author abstract)

AD-774 989/8GA Reprint
Pennsylvania State Univ University Park
THE LASER-DOPPLER VELOCIMETER AND ITS APPLICATION TO THE MEASUREMENT OF TURBULENCE,
William K. George, and John L. Lumley. 31 Jan 73, 43p
Contracts Nonr-656(33), N00014-67-A-0385-0013
Availability: Pub. in Jnl. of Fluid Mechanics, v60 pt2 p321-362 1973.

Descriptors: *Laser velocimeters, Turbulent flow, Laminar flow, Spectrum analysis.

The paper examines the spatial and temporal resolution of the laser-Doppler velocimeter. Criteria for meaningful measurements are established. The effect of the random phase fluctuations introduced by the Doppler ambiguity on attempts to measure statistical quantities in turbulent flow is examined. An operational laser-Doppler velocimeter is described and measurements in both laminar and turbulent flow are presented.

AD-775 022/7GA PC$5.25/MF$1.45
Naval Postgraduate School Monterey Calif
BOTTOM AND SURFACE PROXIMITY EFFECTS ON THE ADDED MASS OF RANKINE OVOIDS.
Master's thesis,
Monty George Fickel. Dec 73, 43p

Descriptors: *Geometric forms, *Hydrodynamics, Mass, Lift to drag ratio, Vibration, Resonant frequency, Theses.
Identifiers: Rankine ovoids.

The free-surface and bottom-proximity effects on the added mass of Rankine ovoids of various length-to-diameter ratios were experimentally investigated by vertically oscillating the ovoids normal to their major axis. The results have shown that the bottom-proximity increases the added mass and the free-surface proximity decreases it. Furthermore, the added mass increases with increasing length-to-diameter ratio, i.e., for more cylinder-like ovoids, and approaches that predicted analytically for an infinitely long cylinder. (Modified author abstract)

AD-775 036/7GA MF$1.45
Illinois Inst of Tech Chicago Dept of Mechanics Mechanical and Aerospace Engineering
EFFECT OF AN OSCILLATING FREE STREAM ON THE UNSTEADY PRESSURE ON A CIRCULAR CYLINDER,
H. M. Hatfield, and M. V. Morkovin. 9 Jun 72, 9p AFOSR-TR-74-0226
Contract F44620-69-C-0022
Availability: Paper copy available from The American Society of Mechanical Engineers, 345 East 47th St., New York, N.Y. 10017. PC$3.00 as Paper No. 72-WA/FE-12.

Descriptors: *Pressure, *Cylindrical bodies, Oscillation, Vortices, Frequency.
Identifiers: Unsteady flow.

An experimental investigation was made of the unsteady pressure on a circular cylinder in a free stream of constant and oscillating velocity. Consideration of possible resonant coupling mechanisms between the Karman vortex street fluctuations and freestream velocity oscillations showed such coupling to be insignificant, if any. It appears that the independence of symmetric and antisymmetric modes in linear systems brings about this fortunate circumstance in these nonlinear flows. Designs involving bluff bodies in flows with pulsations should therefore be much safer than previously believed. In such flows the Strouhal number evidently scales with the 'instantaneous' velocity when the pulsations are slow and with the mean velocity when the pulsating frequency is of the same order as the frequency of the vortex street. (Author)

AD-775 042/5GA Reprint
Illinois Inst of Tech Chicago Dept of Mechanics Mechanical and Aerospace Engineering
VARIATIONAL ANALYSIS OF THE FLOW DEVELOPMENT IN THE ENTRANCE REGION OF CIRCULAR TUBES AND PARALLEL-PLATE CHANNELS,
L. N. Tao, and S. D. Gupta. 1973, 18p AFOSR-TR-74-0227
Contract F44620-69-C-0022
Availability: Pub. in Developments in Mechanics, v7, Proceedings of the Midwestern Mechanics Conference (13th), Pittsburgh, Pa. 13-15 Aug 73 p247-263 1973.

Descriptors: *Channels, *Tubes, *Fluid flow, Laminar flow, VAriations, Fluid mechanics, Approximation(Mathematics), Numerical analysis, Navier Stokes equations.

Variational principles are obtained for the flow development in the entrance region of circular tubes and parallel-plate channels. Since the system is non-conservative, the variational formulations are not of the Hamiltonian type. They are constructed based upon the use of convolutions. By means of the Rayleigh-Ritz procedure specific approximate solutions are found, resulting in relatively simple calculations. Both velocity and pressure drop computations show excellent agreement with the exact solution of the linearized problem. (Author)

AD-775 050/8GA PC$4.50/MF$1.45
Advisory Group for Aerospace Research and Development Paris (France)
DIGITAL TECHNIQUES IN TURBULENCE RESEARCH.
AGARDograph rept.,
Carl H. Gibson. Dec 73, 30p Rept no. AGARD-AG-174
NATO furnished.

Descriptors: *Turbulent flow, *Data processing, Digital systems, Statistical analysis, Computer graphics, Probability density functions.
Identifiers: IBM 1130 computers.

Contents:
Approaches to digital turbulence data analysis;
Statistical description of turbulent fields;
Digital estimates of turbulence statistical parameters;
Digital turbulence analysis system;
Future development.

AD-775 052/4GA PC$4.00/MF$1.45
California Univ San Diego La Jolla Dept of Applied Mechanics and Engineering Sciences
ON THE TWO-DIMENSIONAL MIXING REGION.
Technical rept.,
F. H. Champagne. Jun 73, 97p AFOSR-TR-74-0191
Grant AF-AFOSR-2287-72

Descriptors: *Two dimensional flow, *Incompressible flow, *Mixing, Turbulence, Graphics, Curve fitting, Probability density functions, Computer applications.
Identifiers: Shear flow.

An experimental investigation of the two-dimensional incompressible mixing layer was carried-out. The measurements provide new information on the development of the mean and turbulent fields towards a self-preserving state and on the higher-order statistical characteristics of the turbulent field. The revelance of initial conditions on the development of the flow is discussed in view of both present and previous data. Measurements of spectra, probability densities and moments to eigth order of all three velocity component fluctuations at various transverse position across the flow were carried-out using an on-line digital data acquisition system. The probability density distributions of the derivative and the derivative squared of the longitudinal and lateral velocity fluctuations were also determined. (Modified author abstract)

AD-775 103/5GA PC$13.00/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
A NUMERICAL SOLUTION OF INCOMPRESSIBLE TURBULENT CHANNEL FLOWS BY INVARIANT MODELING.
Doctoral thesis,
Robert Poplawski. Feb 74, 197p Rept no. DS/AE/74-1

Descriptors: *Channel flow, *Incompressible flow, *Turbulent flow, Flow fields, Partial differential equations, Reynolds number, Boundary layer, Computer applications, Numerical integration, Theses.

A numerical technique was developed for incompressible turbulent channel flows which predicts the entire flow field downstream of any initial station. The technique includes any of the flow fields from a two-dimensional confined ejector region to the fully developed turbulent flow regime. The continuity, momentum, four one-point velocity correlations and a volumetric constraint equation are used as the fundamental governing equations. Closure is achieved by using Donaldson's Invariant Models which requires the specification of six constants to accommodate the experimental data. (Modified author abstract)

AD-775 134/0GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
POSSIBILITIES OF CHANGING THE MICROSTRUCTURE OF A TURBULENT FLOW DURING INVESTIGATIONS OF CONVECTIVE HEAT EXCHANGE,
E. Ya. Epik, and L. G. Kozlova. 31 Jan 74, 15p
Rept no. FTD-HT-23-292-74
Edited trans. of Teplofizika i Teplotekhnika (USSR) n22 p73-78 1972, by Paul J. Reiff.

Descriptors: *Turbulent flow, *Heat transfer, Translations, USSR.

AD-775 257/9GA PC$4.50/MF$1.45
Yale Univ New Haven Conn Dept of Engineering and Applied Science
COMPUTER PROGRAMS FOR CALCULATING CONDENSATION RATE IN STEADY, ADIABATIC EXPANSIONS IN SUPERSONIC NOZZLES.
Technical rept.,
Benjamin J. C. Wu. Jan 74, 118p Rept no. TR-26
Contract N00014-67-A-0097-0012

Descriptors: *Supersonic flow, *Supersonic nozzles, *Condensation, Gas dynamics, Nucleation, Computer programs, Computations, Numerical integration, FORTRAN.

The computer programs written in FORTRAN language for the numerical solution of supersonic nozzle flows with condensation are presented. These programs are based on Oswatitsch's formulation of one dimensional nozzle flow of ideal gases with subcritical heat addition. Integration of the coupled gasdynamic equations for the flow and the kinetic equations of condensation is done in a stepwise manner in the flow direction downstream from the throat, using a fourth order Runge-Kutta numerical integration algorithm. The nozzle cross-sectional area distribution, and physical properties of the vapor and condensate are written in separate sub-programs. The various forms of rate equations of homogeneous nucleation (classical or statistical mechanical) and free molecular droplet growth (for various ranges of droplet temperatures) are written in standard froms as several interchangeable subroutines. Detailed description of the program, flow charts, and sample calculations are included in the appendices. (Author)

AD-775 268/6GA Not available NTIS
Mcgill Univ Montreal (Quebec) Dept of Mechanical Engineering
MEASUREMENTS IN A SELF-PRESERVING PLANE WALL JET IN A POSITIVE PRESSURE GRADIENT,
H. P. A. H. Irwin. 3 Apr 73, 32p
Availability: Pub. in Jnl. of Fluid Mechanics, v61 pt1 p33-63 1973.

Descriptors: *Jets, Pressure gradients, Walls, Canada.

Measurements of a wall jet in a self-preserving pressure gradient are described. The quantities measured with a linearized hot-wire anemometer were the mean velocity, the turbulence stresses, triple and quadruple velocity correlations, intermittency and spectra of the longitudinal turbulence intensity.

AD-775 299/1GA PC$4.75/MF$1.45
Naval Ship Research and Development Center Bethesda Md

AN EXPERIMENTAL STUDY OF THE INTERMITTENT PROPERTIES OF THE BOUNDARY LAYER PRESSURE FIELD DURING TRANSITION ON A FLAT PLATE.
Fred C. DeMetz, and Mario J. Casarella. Nov 73, 130p Rept no. NSRDC-4140

Descriptors: *Boundary layer, *Transitions, *Pressure, Reynolds number, Plates, Turbulence.

The properties of the intermittent wall pressure field were measured in the transition boundary layer on a large flat plate in an anechoic wind tunnel. Natural transition was achieved with a mild favorable pressure gradient at Reynolds numbers, based on downstream distance from the plate's leading edge, in excess of 7,000,000. The development of the laminar boundary layer prior to transition was in agreement with numerical solutions to the laminar boundary layer equations and with stability criteria for pressure gradient effects. The temporal, spatial, and spectral properties of the transition wall pressure field associated with the natural transition process occurring on the plate are obtained as a function of the intermittency factor, and compared with those of the fully turbulent pressure field. Specifically, the mean-square pressure, spectral densities, convection velocities, distributions of burst periods and burst rates of the intermittent pressure field are computed from the data. (Author)

AD-775 405/4GA PC$3.25/MF$1.45
Army Engineer Waterways Experiment Station Vicksburg Miss
SIMILITUDE CONDITIONS IN FREE-SURFACE VORTEX FORMATIONS.
Final rept.,
Larry L. Daggett, and Garbis H. Keulegan. Jan 74, 38p Rept no. AEWES-Misc-Paper-H-74-1 AROD-I-425.1-EL

Descriptors: *Vortices, *Flow fields, *Viscous flow, Test methods, Water flow, Mixtures, Glycerols, Oils, Reynolds number, Tanks(Containers), Orifices, Guide vanes, Angles, Velocity, Control systems.
Identifiers: *Surface tension, Weber number.

The report describes an investigation into the effects of fluid viscosity and surface tension on free-surface vortex flows and presents the results of this study. Experiments were conducted in two different sized cylindrical tanks with adjustable vanes at the perimetry to allow varying degrees of initial circulation to be generated at the entrance to the test section. Different fluids were used to investigate the effects of viscosity and surface tension on the incipient conditions for vortex formation and vortex size and shape. (Modified author abstract)

AD-775 514/3GA PC$5.00/MF$1.45
Scripps Institution of Oceanography La Jolla Calif Advanced Ocean Engineering Lab
EXPERIMENTAL STUDY OF VORTICES GENERATED BY OSCILLATORY FLOW OVER RIPPLED SURFACES.
Doctoral thesis,
Edward Brant Tunstall. Dec 73, 154p Rept no. AOEL-55
Contract N00014-69-A-0200-6012

Descriptors: *Vortices, *Ripples, *Ocean waves, Surface waves, Oscillation, Differential equations, Curve fitting, Least squares method, Theses, Sand, Sediment transport.
Identifiers: Gravity waves.

Vortices generated by oscillatory flow over asymmetrical and symmetrical ripples have been investigated. The vortices over asymmetrical ripples were investigated to study the possibility of using such ripple forms to control the direction of sand movement in the nearshore zone. The vortices over symmetrical ripples were investigated to ascertain the amount of wave energy loss that could be attributed to the formation of vortices. (Modified author abstract)

AD-775 537/4GA PC$4.00/MF$1.45
National Research Council of Canada Ottawa (Ontario) Div of Mechanical Engineering
QUARTERLY BULLETIN OF THE DIVISION OF MECHANICAL ENGINEERING AND THE NATIONAL AERONAUTICAL ESTABLISHMENT.
Rept. for 1 Oct-31 Dec 73.
31 Dec 73, 84p Rept no. DME/NAE-1973(3)
See also report dated 30 Sep 72, AD-752 027.

Descriptors: *Aeronautical engineering, *Bioengineering, *Fluid mechanics, Aerodynamics, Reviews, Wind tunnel tests, Control systems, Human factors engineering, Pattern recognition, Hydraulic equipment, Birds, Low temperature, Aeronautical laboratories, Marine engineering, Canada.
Identifiers: Bulletins.

Research is reported on bioengineering developments, the wind tunnel development of a low drag motorcycle, and the interaction of electromagnetic fields with birds. In addition current projects are noted on control systems, VTOL engines, flight research, fuels and lubricants, gas dynamics, high speed aerodynamics, hydraulics, instruments, low temperature characteristics, and marine dynamics.

CEA-CONF-2363 PC$3.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Grenoble, 38 (France). Dept. De Transfert et Conversion d'Energie.
CLASSIFICATION OF TWO PHASE FLOW INSTABILITY PHENOMENA.
J. A. Boure. 1972, 5p CONF-720686-4
U.S. Sales Only.

Descriptors: (*Two-phase flow, *Instability).

For abstract, see NSA 29 05, number 10065.

CEA-CONF-2364 PC$3.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Grenoble, 38 (France).
HYDRODYNAMIC OSCILLATIONS IN PARALLEL-FED HEATING CHANNELS.
S. Fabrega. 10p CONF-730665-2
U.S. Sales Only.

Descriptors: (*Heat exchangers, *Hydrodynamics), (*Fluid flow, *Instability), Oscillations.

For abstract, see NSA 29 05, number 10066.

LA-UR-73-1473 PC$3.25/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
RECENT ADVANCES IN COMPUTATIONAL FLUID DYNAMICS.
T. D. Butler. 1973, 21p CONF-731202-1
Contract W-7405-eng-36

Descriptors: (*Fluid mechanics, *Computer calculations), Differential equations, Finite difference method, Transients.

For abstract, see NSA 29 05, number 10068.

N74-14973/3GA PC$6.50/MF$1.45
Technion - Israel Inst. of Tech., Haifa. Dept. of Aeronautical Engineering.
TRANSVERSE VELOCITY AND PRESSURE VARIATIONS IN FINITE JOURNAL BEARINGS AND CYLINDERS.
O. Pinkus. Jul 72, 88p TAE-157

Descriptors: *Fluid flow, *Journal bearings, *Rotating cylinders, Pressure gradients, Rotating fluids, Stresses, Viscous fluids.

For abstract, see STAR 1206

N74-14974/1GA PC$4.50/MF$1.45
National Aeronautical Lab., Bangalore (India).

APPLICATION OF DIFFERENTIAL EQUATION FOR TURBULENT VISCOSITY TO THE ANALYSIS OF PLANE NON-SELF-SIMILAR FLOWS.
A. N. Sekundov. Aug 72, 46p NAL-TR-144
Tran-Transl. Into English from Izv. Akad. Nauk Sssr, Mekh. Zhidk. Gaza (Moscow), No. 5, Sep. - Oct. 1971 p 114-127.

Descriptors: *Differential equations, *Turbulent wakes, Numerical analysis, Pressure gradients, Turbulent boundary layer.

For abstract, see STAR 1206

N74-14976/6GA PC$12.50/MF$1.45
Stanford Univ., Calif. Dept. of Aeronautics and Astronautics.
UNSTEADY VISCOUS EFFECTS IN THE FLOW OVER AN OSCILLATING SURFACE.
J. I. Lerner. Dec 72, 207p NASA-CR-136581, SUDAAR-453
Contracts NGR-05-020-102, F44620-68-C-0036

Descriptors: *Mathematical models, *Oscillating flow, *Surface waves, *Turbulent boundary layer, *Wave interaction, Inviscid flow, Panel flutter, Pressure measurements, Supersonic flow, Water waves, Wind effects.

For abstract, see STAR 1206

N74-14978/2GA PC$2.75/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
DECAY OF FAR FLOW FIELD IN TRAILING VORTICES.
B. S. Baldwin, N. A. Chigier, and Y. S. Sheaffer. Feb 74, 18p NASA-TN-D-7568, A-5181

Descriptors: *Boundary layer flow, *Decay, *Turbulent wakes, *Vortices, Approximation, Finite difference theory, Flow velocity, Incompressible flow.

For abstract, see STAR 1206

N74-14979/0GA PC$5.75/MF$1.45
Oxford Univ. (England). Engineering Lab.
DNF: A DYNAMIC FILTER FOR THE ON-LINE ESTIMATION AND PREDICTION OF TRANSIENT PRESSURES AND FLOWS IN A GAS NETWORK.
R. Hastings-james. 27 Mar 73, 72p REPT-1064/73

Descriptors: *Dynamic models, *Filtration, *Gas pressure, *Pressure measurements, *Transient pressures, Computer programs, Dynamic characteristics, Filtration, Gas flow, Simulation.

For abstract, see STAR 1206

PATENT-3 753 616 Not available NTIS
Department of the Air Force Washington D C
LASER DOPPLER VELOCIMETER DETECTOR.
Patent,
Winfred H. Goethert. Filed 22 Nov 71, patented 21 Aug 73, 3p Rept nos. PAT-APPL-200 718,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Laser velocimeters, *Patents, Flow fields, Doppler effect, Signal processing.
Identifiers: PAT-CL-306-28.

The patent describes a laser doppler velocimeter detector for determining velocity information in flow fields in which a laser beam used in the flow field is split into a pair of beams, one of which has its plane of polarization rotated 90 degrees. A portion from each of the oppositely polarized beams is mixed to produce the desired doppler information. Polarization beam splitting is provided producing two beams, each containing doppler shifted information. Each of the beams is detected

to provide a pair of representative electrical signals, one of which is subsequently inverted and added to the uninverted to result in a signal having only the frequency content of the original doppler information.

PB-228 020/4GA PC$12.50/MF$1.45
Michigan Univ., Ann Arbor. Cavitation and Multiphase Flow Lab.
A NEW TECHNIQUE FOR THE MEASUREMENT OF CAVITATION NUCLEI SPECTRA.
Technical rept.,
Osman S. M. Ahmed. Oct 73, 188p UMICH-013570-32-T
Grant NSF-GK-1889

Descriptors: *Cavitation, *Bubbles, Counting, Electric equipment, Hydraulic test tunnels, Spectral determination, Air entrainment.
Identifiers: Coulter counters.

A new technique was developed using a modified Electronic Coulter Counter which was originally developed for the measurement of particle sizes in other fields of science and engineering. The device was used to measure the cavitation nuclei size distribution in a closed high-speed water tunnel at different pressures and velocities, under both cavitating and non-cavitating conditions. The work also included the study of the cavitation nuclei pressurization history under short term pressurization periods as well as long term pressurization periods. The results obtained showed the diminution of cavitation nuclei population with time and pressure as a result of the entrained gas becoming dissolved. Also, part of the total gas content which is entrained and is responsible for maintaining cavitation, is a very small portion of the total gas content. (Modified author abstract)

SGAE-2176 PC$4.00/MF$1.45
Oesterreichische Studiengesellschaft fuer Atomenergie G.M.B.H., Seibersdorf. Inst. Fuer Reaktortechnik.
STEADY HEAT TRANSFER IN A TUBE WITH TURBULENT FLOW.
H. Schmidl. Sep 73, 36p
In German. U.S. Sales Only.

Descriptors: (*Turbulent flow, *Heat transfer), Fluid flow, Navier-stokes equation, Tubes.

For abstract, see NSA 29 05, number 10070.

20E. Masers and Lasers

AD-774 792/6GA PC$3.25/MF$1.45
Army Electronics Command Fort Monmouth N J
NUMERICAL ANALYSIS OF A COAXIAL FLASHLAMP - PUMPED RHODAMINE 6G DYE LASER.
Technical rept.,
H. H. Theissing, R. H. Wright, Jr., and T. F. Ewanizky. Dec 73, 44p Rept no. ECOM-4178

Descriptors: *Dye lasers, Mathematical models, Rates, Efficiency, Laser beams.
Identifiers: *Organic dye lasers, Rhodamine 6G, Xanthene dyes.

The coefficients of the laser rate equations describing a pulsed, coaxial flashlamp-pumped organic dye laser, which are not directly accessible, are determined from experimental data, such as, shape of the pump, shape of laser output pulse and energy output of laser at optimum coupling. Computer solutions of the laser rate equations using these coefficients agreed with the experimentally measured laser pulse shape. Also, with the numerical data obtained, an energy balance between spontaneous emission, lost stimulated emission, and useful stimulated emission (laser output) could be established. The effects of amplified spontaneous emission (superradiance) on efficiency and beam quality are discussed. (Author)

AD-774 793/4GA PC$3.25/MF$1.45
Army Electronics Command Fort Monmouth N J
BEAM QUALITY OF PULSED ORGANIC DYE LASERS.
Technical rept.,
Theodore F. Ewanizky. Oct 73, 32p Rept no. ECOM-4163

Descriptors: *Dye lasers, *Laser beams, Light pulses, Quality, Efficiency, Tunable lasers, Optical pumping, Flash lamps.
Identifiers: *Organic dye lasers.

Various aspects of flashlamp-pumped organic dye laser efficiency and beam quality are investigated. A coaxial Marx-Bank driver circuit and flashlamp system are described. Shock wave induced optical distortion in the active solution was identified as a cause for premature laser termination. Beam quality experiments and theoretical analysis indicate that intrinsically strong amplified spontaneous emission effects are responsible for the relatively large beam divergence typically observed in pulsed dye lasers. Flux-injection techniques and mode-locking in dye lasers are discussed as possible remedial measures. (Author)

AD-774 908/8GA PC$3.25/MF$1.45
Mcdonnell Douglas Research Labs St Louis Mo Radiation Sciences Dept
LASER KINETIC DATA DEVELOPMENT.
Final rept. 29 Dec 72-29 Dec 73,
Thomas J. Menne. 29 Dec 73, 35p Rept no. MDC-Q0510 RK-CR-73-7
Contract DAAH01-73-C-0372

Descriptors: *Carbon monoxide lasers, *Chemical lasers, Nozzle gas flow, Computerized simulation, Gas dynamics, Molecular energy levels, Reaction kinetics, Chemical reactions, Energy transfer.

The objectives of this contract were to investigate the possibility of a CO chain reaction chemical laser based on O2 + CS chemistry and to model various schemes, particularly gas dynamic expansion, for extracting more power from CO chemical lasers. The direct reaction of O2 + CS was investigated experimentally. Measurements of the vibrational energy distribution of CO from the CS + O2 reaction with a Fabry-Perot microwave resonator/CO chemical laser system were also part of the effort on the first objective. The second effort involved the CO chemical laser modeling code developed under a previous MICOM contract. This computer program was modified to include the cooling effects of gas dynamic expansion through a supersonic nozzle on chemically-formed CO. Both nozzle-cooled and non-nozzle-cooled chemical lasers were modeled. The modeling code was further modified to determine the effect of gas additives on the laser output characteristics. (Modified author abstract)

AD-774 998/6GA Reprint
Air Force Weapons Lab Kirtland AFB N Mex
CONTINUOUS UNIFORM EXCITATION OF MEDIUM-PRESSURE CO2 LASER PLASMAS BY MEANS OF CONTROLLED AVALANCHE IONIZATION,
Alan E. Hill. Feb 74, 8p Rept no. AFWL-TR-74-501
Availability: Pub. in Applied Physics Letters, v22 n12 p670-673, 15 Jun 73.

Descriptors: *Carbon dioxide lasers, *Gas lasers, Excitation, Gas ionization, Photoionization, Electric discharges, Infrared lasers.

A sequence of 50 to 75 nanosecond high voltage pulses in combination with photoionization produce spatially uniform continuous electron densities of 2 x 10 to the 11th power with a 10 to 20 percent ripple at 20,000 Hertz in 150 torr CO2 laser mixes. A separate continuous electric field ranging from 3 to 6 KV/cm atm is used to heat the electrons, which loads greater than 0.25 J/cc-atm into the plasma without arc breakdown. As is the case with E-beam plasmas, E/P and n(e) may be controlled independently. Hence, electron beams, flow constrictions, etc. are not necessary to produce uniform plasmas for CW high power electric gas laser systems. (Author)

AD-775 078/9GA Reprint
Stanford Univ Calif Microwave Lab
SIMULTANEOUS Q-SWITCHING AND MODE-LOCKING IN THE CW ND:YAG LASER,
D. J. Kuizenga, D. W. Phillion, T. Lund, and A. E. Siegman. 7 Aug 73, 8p Rept no. ML-2207 AFOSR-TR-74-0200
Contract F44620-71-C-0053, Grant NGL-05-020-103
Availability: Pub. in Optics Communications, v9 n3 p221-226 Nov 73.

Descriptors: *Neodymium lasers, *Light pulses, Q switching, Yttrium aluminum garnet, Continuous waves.
Identifiers: *YAG lasers, Mode locked lasers.

The theory of transient mode-locking for an active modulator in a laser with a homogeneously broadened line is presented. The theory is applied to simultaneously Q-switched and mode-locked Nd:YAG lasers and good agreement between theory and experiment is obtained. The main conclusion is that under usual Q-switched operating conditions the mode-locking process does not have sufficient time to build up to steady-state conditions. Also presented is a method to overcome this problem by allowing the laser to prelase before the Q-switch is opened. Mode-locked pulses whose width approaches the steady-state value are obtained. The transient mode-locking theory presented here also applies to actively mode-locking TEA CO2 lasers and to other types of simultaneously pulsed and mode-locked lasers. (Author)

AD-775 146/4GA PC$6.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
EMISSION SPECTRUM OF ELECTROIONIZED CO2-LASERS,
N. G. Basov, E. M. Belenov, and V. A. Danilychev. 4 Feb 74, 57p Rept no. FTD-MT-24-767-73
Edited machine trans. of Akademiya Nauk SSSR. Fizicheskii Institut. Preprint, n58 p1-58 1972, by Robert Allen Potts.

Descriptors: *Carbon dioxide lasers, *Tunable lasers, Molecular energy levels, Emission spectra, Pressure, USSR, Translations.
Identifiers: Pressure broadening, Line broadening.

Contents: Some types of retunable lasers; broadening of spectral lines by pressure; and, experimental installation, obtained results and their discussion.

AD-775 211/6GA PC$5.00/MF$1.45
Litton Systems Inc., Morris Plains, N.J. Airtron Div.
PREPARATION AND SINGLE CRYSTAL GROWTH OF LIYF4 LASER MATERIALS.
Final rept. 1 Jan-31 Dec 73,u7409
Robert Uhrin, Roger F. Belt, Richard C. Puttbach, and Durand R. Kinloch. 11 Feb 74, 37p
Contract N00014-70-C-0379

Descriptors: *Laser materials, *Lithium fluorides, *Crystal growth, Yttrium compounds, Fluorides, Single crystals, Chemical reactions, Phase diagrams.
Identifiers: *Yttrium fluorides, *Yttrium tetrafluoroyttriate, YLF lasers, Czochralski method.

The report describes techniques for preparation of high purity fluorides suitable for laser crystal hosts. Growth methods for LiYF4 were also developed using a constant flow of HF. The YF3 and rare earth fluorides are prepared from 5 or 6-9's polycrystalline oxides. A special platinum reac-

tor was designed to convert oxides to fluorides via an HF reaction. Trifluorides were prepared at 800-900C and melted under HF at 1050-1200C. This prevented formation of oxide and oxyfluoride impurities in the melt. Growth of LiYF4 was accomplished in a resistively heated platinum apparatus and crucible using a modified Czochralski method. Growth occurred under a fixed pressure of HF. Preliminary results gave crystals of high optical quality, free of OH(-), scattering sites, and low impurity level. The procedures should be applicable to other YLF materials in volume production. (Author)

AD-775 382/3GA Reprint
Rochester Univ N Y Dept of Physics and Astronomy
SPATIAL COHERENCE OF LASER OUTPUT FAR BELOW THRESHOLD,
H. J. Kimble, and L. Mandel. 11 Sep 73, 5p
AFOSR-TR-74-0205
Contract F44620-69-C-0086
Availability: Pub. in Jnl. of the Optical Society of America, v63 n12 p1550-1552 Dec 73.

Descriptors: *Laser beams, *Coherence, Coherent radiation, Spatial distribution, Correlation techniques, Functions(Mathematics).

The light emerging from the output aperture of a laser should be spatially coherent even when the laser is operated far below its threshold and behaves substantially as a thermal source. The spatial coherence has been demonstrated experimentally by photoelectric correlation measurements at different pairs of points in the aperture. (Author)

AD-775 314/8GA PC$3.00/MF$1.45
Washington State Univ Pullman Dept of Chemistry
Q-SWITCHING AND MODE-LOCKING THE ND(3+)-GLASS LASER WITH THE NICKEL DITHIENES.
Technical rept.,
Douglas Magde, Bruce A. Bushaw, and Maurice W. Windsor. Jan 74, 6p Rept no. TR-2
Contract N00014-68-A-0410-0003

Descriptors: *Neodymium lasers, *Q switching, *Mode locked lasers, Nickel compounds, Metalorganic compounds, Organic sulfur compounds.
Identifiers: Saturable absorbers.

The compound bis-(4-dimethylaminodithiobenzil)-nickel (BDN) was shown to be a photochemically stable saturable absorber suitable as a Q-switch for Nd3+-glass lasers.

AD-775 411/2GA PC$4.75/MF$1.45
Lockheed Missiles and Space Co Inc Huntsville Ala Huntsville Research and Engineering Center
CHEMICAL LASER ANALYSIS DEVELOPMENT. VOLUME I. LASER AND MIXING PROGRAM THEORY AND USER'S GUIDE.
Final rept. 24 Oct 72-24 Oct 73,
Juergen Thoenes, A. J. McDanal, Alan W. Ratliff, and Sheldon D. Smith. Oct 73, 147p* Rept no. LMSC-HREC-TR-D306900-1 RK-CR-73-2-Vol-1
Contract DAAH01-73-C-0232
See also Volume 2, AD-775 412.

Descriptors: *Chemical lasers, *Gas dynamics, *Computer programming, Two dimensional flow, Chemical reactions, Mixing, Combustion, Thermodynamics, Transport properties, Continuous waves, FORTRAN, Instruction manuals, Carbon dioxide lasers, Gas dynamic lasers.
Identifiers: LAMP computer program, Programming manuals, Deuterium fluoride lasers.

A new Laser And Mixing Program (LAMP) is described which considers the coupling between gasdynamic properties, cavity characteristics, and resulting laser radiation for diffusion-type chemical laser oscillator cavities. The formulation assumes parallel mixing and constant lateral pressure with lasing due to single or multiple transitions between certain vibrational/rotational molecular energy levels. Excitation of the active medium traversing a Fabry-Perot optical cavity is caused by highly exothermic reactions between gradually mixing reactants discharged from a grid nozzle. Uniform, premixed inviscid laser cavity flows can be investigated as a special case of the more general analysis. The report contains a description of the analysis as well as a user's manual. (Author)

AD-775 412/0GA PC$4.00/MF$1.45
Lockheed Missiles and Space Co Inc Huntsville Ala Huntsville Research and Engineering Center
CHEMICAL LASER ANALYSIS DEVELOPMENT. VOLUME II. TWO-DIMENSIONAL FRESNEL INTEGRAL LASER AND MIXING PROGRAM USER'S GUIDE.
Final rept. 24 Oct 72-24 Oct 73,
Juergen Thoenes, Charles South, and David B. Rensch. Oct 73, 86p Rept no. LMSC-HREC-TR-D306900-2 RK-CR-73-2-Vol-2
Contract DAAH01-73-C-0232
Prepared in cooperation with Hughes Research Labs., Malibu, Calif. See also Volume 1, AD-775 411 and Volume 3, AD-775 413.

Descriptors: *Chemical lasers, *Gas dynamics, *Computer programming, Gas dynamic lasers, Carbon dioxide lasers, Two dimensional flow, Chemical reactions, Mixing, Gain, Thermodynamics, Transport properties, Continuous waves, FORTRAN, Instruction manuals.
Identifiers: TDFI-LAMP computer program, Programming manuals, Deuterium fluoride lasers.

The Two-Dimensional Fresnel Integral Laser and Mixing Program (TDFI-LAMP) is described. This computer program represents a combination of the Hughes' developed Fresnel Integral Computer Program (FICP) and the Lockheed-developed Laser And Mixing Program (LAMP), thereby providing a sophisticated tool for the study of the interrelated gasdynamic and optical properties of chemical laser resonators. (Author)

AD-775 413/8GA PC$3.75/MF$1.45
Lockheed Missiles and Space Co Inc Huntsville Ala Huntsville Research and Engineering Center
CHEMICAL LASER ANALYSIS DEVELOPMENT. VOLUME III. LOCKHEED ONE-DIMENSIONAL LASER AND MIXING PROGRAM GUIDE.
Final rept. 24 Oct 72-24 Oct 73,
Ronald R. Mikatarian, and Larry R. Ring. Oct 73, 52p Rept no. LMSC-HREC-TR-D306900-3 RK-CR-73-2-Vol-3
Contract DAAH01-73-C-0232
See also Volume 2, AD-775 412 and Volume 4, AD-775 414.

Descriptors: *Chemical lasers, *Gas dynamics, *Computer programming, One dimensional flow, Chemical reactions, Mixing, Thermodynamics, Electron transitions, Continuous waves, Instruction manuals.
Identifiers: ODLAMP computer program, Programming manuals.

The Lockheed One-Dimensional Laser and Mixing Program (ODLAMP) is described for analyzing multi-species lasing in a chemically reacting one-dimensional stream with mass addition. Mass is assumed to be injected (at a prescribed rate) from each of two separate streams, into a primary lasing stream. Lasing due to P-transitions (i.e., transitions proceeding from (v+1, J-1) to (v, J)) is treated. Both the analysis and computer programs are presented, including an input guide, sample calculation and flow chart. (Author)

AD-775 414/6GA PC$4.00/MF$1.45
Lockheed Missiles and Space Co Inc Huntsville Ala Huntsville Research and Engineering Center
CHEMICAL LASER ANALYSIS DEVELOPMENT. VOLUME IV. METHOD OF CHARACTERISTICS LASER AND MIXING PROGRAM THEORY AND USER'S GUIDE.
Final rept. 24 Oct 72-24 Oct 73,
Alan W. Ratliff, Juergen Thoenes, and Sheldon D. Smith. Oct 73, 93p Rept no. LMSC-HREC-TR-D306900-4 RK-CR-73-2-Vol-4
Contract DAAH01-73-C-0232
See also Volume 3, AD-775 413 and Volume 5, AD-775 415.

Descriptors: *Chemical lasers, *Gas dynamics, *Computer programming, Two dimensional flow, Carbon dioxide lasers, Gas dynamic lasers, Chemical reactions, Combustion, Thermodynamics, Transport properties, Mixing, Electron transitions, Continuous waves, Gain, Instruction manuals.
Identifiers: MOC-LAMP computer program, Programming manuals, Deuterium fluoride lasers.

A new laser and mixing computer program is described which considers the coupling between gasdynamic properties, cavity characteristics, and resulting laser radiation for diffusion-type chemical laser oscillator cavities. The formulation assumes non-uniform mixing with lateral pressure gradients and lasing due to a single transition between the upper and lower laser levels. Excitation of the active medium traversing a Fabry-Perot optical cavity is caused by highly exothermic reactions between gradually mixing reactants discharged from a grid nozzle. Uniform, premixed inviscid laser cavity flows can be investigated as a special case of the more general analysis. (Author)

AD-775 415/3GA PC$4.75/MF$1.45
Lockheed Missiles and Space Co Inc Huntsville Ala Huntsville Research and Engineering Center
CHEMICAL LASER ANALYSIS DEVELOPMENT. VOLUME V. REACTION MODELS AND ANALYSIS.
Final rept. 24 Oct 72-24 Oct 73,
Shelby C. Kurzius, A. J. McDanal, John H. McDermit, Ronald R. Mikatarian, and Alan W. Ratliff. Oct 73, 141p Rept no. LMSC-HREC-TR-D306900-5 RK-CR-73-2-Vol-5
Contract DAAH01-73-C-0232
See also Volume 4, AD-775 414 and Volume 6, AD-775 416.

Descriptors: *Chemical lasers, *Gas dynamics, *Computer programming, Chemical reactions, Reaction kinetics, Combustion, Mixing, Gas dynamic lasers, Carbon dioxide lasers, Flow fields, Tables(Data), Supersonic flow, Mathematical models.
Identifiers: Hydrogen fluoride lasers, Deuterium fluoride lasers.

Chemical kinetics inputs and the results of analyses undertaken are presented in support of the development and application of numerical models for the evaluation of supersonic flow chemical laser performance. Reactions and rate coefficients in use to develop reaction models for H2-F2, H2-F2-CO2, H2-F2-NO-HI, D2-F2 and D2-F2-CO2 chemical lasers are listed and discussed. Detailed results of parametric studies of an H2-F2 direct combustion chemical laser device and of a D2-F2-CO2 transfer chemical laser device are discussed, stressing the potentially important role of the 'hot' reaction (H (or D) + F2 yields HF(v) + F) and of realistic modeling of optical losses, nozzle velocity profiles and, especially, laminar/turbulent fuel/oxidizer mixing rates. An analysis incorporating the production, dissipation and diffusion of turbulent kinetic energy is presented which is shown to realistically model laminar/turbulent mixing in chemical laser cavity flows. Finally, an exploration attempt to use the Error Minimization technique for chemical laser numerical analysis is described. (Author)

AD-775 416/1GA PC$3.75/MF$1.45
Lockheed Missiles and Space Co Inc Huntsville Ala Huntsville Research and Engineering Center
CHEMICAL LASER ANALYSIS DEVELOPMENT. VOLUME VI. SURVEY OF PRESSURE

RECOVERY METHODS FOR CHEMICAL LASER APPLICATION.
Final rept. 24 Oct 72-24 Oct 73,
L. Ray Baker, Jr., and John H. McDermit. Oct 73, 53p Rept no. LMSC-HREC-TR-D306900-6 RK-CR-73-2-Vol-6
Contract DAAH01-73-C-0232
See also Volume 5, AD-775 415 and Summary, AD-775 417.

Descriptors: *Chemical lasers, *Gas dynamics, Supersonic diffusers, Dynamic pressure, Recovery, Ejectors, Gas pumps, Vacuum pumps, PerformaNCE(Engineering), Continuous waves.

Available data on pressure recovery devices is assembled and analyzed and their suitability assessed for application to chemical laser systems. Performance of unaugmented gasdynamic diffusers are examined and potential devices are reviewed for augmenting (or pumping) the diffuser exhaust gases. Recommendations are made concerning the most attractive pressure recovery technique, and realistic goals for operation of the chemical laser cavity commensurate with pressure recovery technology. (Author)

AD-775 417/9GA PC$3.75/MF$1.45
Lockheed Missiles and Space Co Inc Huntsville Ala Huntsville Research and Engineering Center
CHEMICAL LASER ANALYSIS DEVELOPMENT. SUMMARY VOLUME.
Final rept. 24 Oct 72-24 Oct 73,
John W. Benefield. Oct 73, 52p Rept no. LMSC-HREC-TR-D306900-S RK-CR-73-2-S
Contract DAAH01-73-C-0232
See also Volume 6, AD-775 416.

Descriptors: *Chemical lasers, *Gas dynamics, *Computer programming, One dimensional flow, Two dimensional flow, Fluid mechanics, Chemical reactions, Reaction kinetics, Gas dynamic lasers, Carbon dioxide lasers, Combustion, Mixing, Flow fields.
Identifiers: LAMP computer program, TDFI-LAMP computer program, ODLAMP computer program, MOC-LAMP computer program, Hydrogen fluoride lasers, Deuterium fluoride lasers.

The general objectives of this effort were to improve the analytical tools available for studying chemical lasers and to apply these tools to further the understanding of chemical lasers. Four computer programs are described in the report: (1) One-Dimensional Laser and Mixing Program (ODLAMP); (2) Laser and Mixing Program (LAMP); (3) Two-Dimensional Fresnel Integral Laser and Mixing Program (TDFI-LAMP); and (4) Method-of-Characteristics Laser and Mixing Program (MOC-LAMP). Selected highlights are presented of the computer codes, analyses, results, conclusions and recommendations. The results presented include the effects of fuel/oxidizer ratios, cavity pressure, mixing, optical characteristics, mode of operation, boundary layer and an assessment of the relationship of chemical laser cavity conditions to pressure recovery methods. (Author)

AD-775 499/7GA Reprint
Army Electronics Command Fort Monmouth N J
PARAMETERS IN A DYNAMICALLY COMPRESSED XENON PLASMA LASER,
Aristotle Papayoanou, Rudolf G. Buser, and Irwin M. Gumeiner. 15 Dec 72, 7p
Availability: Pub. in the IEEE Jnl. of Quantum Electronics, vQE-9 n6 p580-585 Jun 73.

Descriptors: *Gas lasers, *Xenon, *Plasmas(Physics), Electron density, Ionized gases, Electron transitions, Line spectra.
Identifiers: *Xenon lasers.

Laser action from triply ionized xenon has been found to occur during the dynamical contraction of the xenon plasma column. Laser lines between the near ultraviolet and the orange portion of the spectrum have been detected. Their peak powers, time of occurrence, duration, wavelength, and coherence length have been measured. Optimum currents and pressures have been found and compared with other published results. In addition, a simplified model of a pinching plasma has been used in conjunction with streak camera picture of the contracting column and time-resolved interferometric measurements of the electron density to estimate electron temperatures. Values of the electron density, temperature, and conductivity of the xenon plasma compare well with published results applicable to high-current pulsed-argon ion lasers. (Author)

AD-775 505/1GA Reprint
Army Electronics Command Fort Monmouth N J
SHOCK-WAVE TERMINATION OF LASER ACTION IN COAXIAL FLASH LAMP DYE LASERS,
T. F. Ewanizky, R. H. Wright, Jr., and H. H. Theissing. 9 Feb 73, 3p
Availability: Pub. in Applied Physics Letters, v22 n10 p520-521, 15 May 73.

Descriptors: *Dye lasers, *Gas dynamics, Flash lamps, Gas discharges, Turbulence, Shock waves.

Shock-wave-induced optical distortion of dye laser solutions in conventional coaxial flash lamps has been observed. An inwardly propagating radial shock wave is generated in the solution upon flash lamp discharge, causing virtually complete scattering of axially directed light within a few microseconds. Laser action is prematurely terminated since rapidly induced optical distortion becomes a substantial impediment during the period of effective laser pumping. (Author)

AD-775 524/2GA Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
LASER BREWSTER WINDOW SEALING TECHNIQUES,
Bernard Smith. 30 Jan 73, 4p
Revision of report dated 25 Aug 72.
Availability: Pub. in IEEE Jnl. of Quantum Electronics, vQE-9 n5 p546-548 May 73.

Descriptors: *Gas lasers, *Seals, Quartz, Glass, Electrostatics, Windows.
Identifiers: *Laser windows.

The application of the Wallis and Pomerantz electrostatic sealing technique to low-temperature glass-to-glass vacuum tight optical windown seals is discussed. The successful sealing of vacuum tight quartz optical windows to quartz tubing at the Brewster angle is described and problem areas are defined. A brief discussion of the sealing mechanism is given and the general equations are defined. (Author)

AD-775 525/9GA PC$3.75/MF$1.45
Hughes Research Labs Malibu Calif
INVESTIGATION OF UV PHOTOIONIZATION SUSTAINED DISCHARGE FOR GAS LASERS.
Semiannual technical rept. 1 Jul-31 Dec 73,
Richard C. Lind, W. M. Clark, and J. Y. Wada. Mar 74, 56p
Contract N00014-73-C-0287, ARPA Order-1807
See also report dated Dec 73, AD-771 437.

Descriptors: *Carbon dioxide lasers, *Infrared lasers, *Gas discharges, Photoionization, Ultraviolet radiation, Plasma generators, Gas lasers, Power measurement, Gain.

The objectives of this program are to investigate and improve ultraviolet (uv) photoionization plasma conditioning techniques, to perform the demonstration of a uv sustained electrical discharge atmospheric pressure CO2 laser, and to establish scalability limits. (Modified author abstract)

AD-775 577/0GA PC$4.00/MF$1.45
United Aircraft Research Labs East Hartford Conn
HIGH POWER DYE LASERS.
Annual rept. 1 Jan 73-28 Feb 74,
A. R. Clobes, C. M. Ferrar, W. H. Glenn, G. L. Ladd, and W. W. Morey. 28 Feb 74, 81p Rept no. UARL-N921617-5
Contract N00014-73-C-0284, ARPA Order-1806
See also report dated 30 Jul 73, AD-764 098.

Descriptors: *Dye lasers, High power, Optical pumping, Flash lamps.
Identifiers: *Organic dye lasers.

The report describes the operation of a high power, repetitively pulsed, flashlamp pumped dye laser. To date an average power of 39 watts at a repetition rate of 100 Hz has been obtained. The techniques employed should be scalable to higher power and higher repetition rate. Experiments to produce frequency sweeping of the laser during the pulse are described. Altimate flashlamp geometries are discussed as are experiments to achieve better spectral matching of the lamp output to the dye. (Author)

CISE-N-159 PC$3.25/MF$1.45
Centro Informazioni Studi Esperienze, Milan (Italy).
DESIGN AND CONSTRUCTION OF A CO SUB 2 LASER WITH SUBATMOSPHERIC PRESSURE IN FLUX.
A. Sironi. Jun 73, 23p
In Italian. U.S. Sales Only.

Descriptors: (*Lasers, *Specifications), (*Ceramics, *Etching), Carbon dioxide, Laser radiation.

For abstract, see NSA 29 05, number 12443.

COM-74-50157/8GA Not available NTIS
National Bureau of Standards, Washington, D.C.
COMPARISON OF THE LASER POWER AND TOTAL IRRADIANCE SCALES MAINTAINED BY THE NATIONAL BUREAU OF STANDARDS.
Final rept.,
Jon Geist, L. B. Schmidt, and W. E. Case. 1973, 4p
Pub. in Applied Optics, v12 n11 p2773-2776 Nov 73.

Descriptors: *Lasers, *Power, *Irradiance, *Standards, Comparison.

The paper describes an intercomparison of the instrument used to realize and maintain the NBS laser power and energy scale with the instrument used to realize and maintain the upper end of the NBS total irradiance scale. The intercomparison was conducted by performing simultaneous measurements of the average power from a cw kyrpton laser with both instruments. The procedure and apparatus of the comparison are described. The measured difference between the two instruments was well within the approximately 1.5% limit of error associated with the intercomparison.

IPP-4-110 PC$4.25/MF$1.45
Max-Planck-Institut fuer Plasmaphysik, Garching/Munich (F.R. Germany).
ELECTRON-BEAM INITIATED HF CHEMICAL LASER.
R. W. F. Gross, and F. Wesner. Apr 73, 45p
In German. U.S. Sales Only.

Descriptors: (*Lasers, *Excitation), Efficiency, Electron beams, Electron sources, Interactions, Pulses.

For abstract, see NSA 29 05, number 12457.

JPRS-61199 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.

DESIGN OF GAS DYNAMICCO2 LASER. 1. AMPLICATION FACTOR,
L. S. Krasitaskaya, A. P. Napartovich, and V. F. Sharkov. 12 Feb 74, 12p
Trans. of Teplofizika Vysokikh Temperatur (USSR) v11 n6 p1155-1161 1973.

Descriptors: *Carbon dioxide lasers, Gas dynamics, Amplification, Translations, USSR.
Identifiers: *Gas dynamic lasers.

The report discusses the problem of determining the amplification factor of a CO2 GDL. Results of calculations are presented in graphical form.

LA-5458-MS PC$4.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
RELATIONSHIP OF SELF-FOCUSING TO SPATIAL INSTABILITY MODES.
A. J. Campillo, S. L. Shapiro, and B. R. Suydam. Nov 73, 4p
Contract W-7405-eng-36

Descriptors: (*Laser radiation, *Focusing), Instability, Instability growth rates, Spatial distribution.

For abstract, see NSA 29 05, number 12466.

PAT-APPL-300 002 PC$3.00/MF$1.45
Department of the Air Force Washington D C
CHEMICAL LASER NOZZLE SYSTEM.
Patent Application,
A. J. Dobrzelecki. Filed 24 Oct 72, 10p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Chemical lasers, *Supersonic nozzles, Patents, Gas lasers.
Identifiers: PAT-CL-331-94-5, *Patent applications.

The patent describes a noval laser nozzle system for use in any chemical laser in which a first gaseous reactant, a second gaseous reactant, and a diluent gas can be used.

PATENT-3 747 004 Not available NTIS
Department of the Air Force Washington D C
INJECTION-LOCKED LASER STABILIZER.
Patent,
Michael W. Sasnett. Filed 14 May 71, patented 17 Jul 73, 5p Rept nos. PAT-APPL-143 368,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Lasers, *Stabilization systems, *Patents, Optical equipment components, Frequency, Stability.
Identifiers: PAT-CL-330-4-3, Frequency stability.

The patent describes an injection-locked laser stabilizer using an injection-locked laser system comprising a small stable laser, an optical frequency isolator (circulator) and a high power laser which is injection-locked by the small stable laser. The stabilizer provides an automatic acquisiton of the injection-locked condition and maintains that condition for an indefinite period.

PATENT-3 750 048 Not available NTIS
Department of the Air Force Washington D C
WINDOW FOR HIGH POWER GASEOUS LASERS.
Patent,
Jacques E. Ludman. Filed 17 May 72, patented 31 Jul 73, 3p Rept nos. PAT-APPL-254 141,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Gas lasers, *Windows, *Patents, Optical equipment components, Laser beams, High power.
Identifiers: PAT-CL-331-94-5.

The invention relates generally to high power gas lasers and more specifically to a window and associated structure that will allow the transmission of a laser beam having an ultra high power density without destroying the window and with minimum thermal lensing.

SLA-73-1022 PC$5.50/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
PARAMETRIC STUDY OF A COLD-CATHODE ELECTRON-BEAM-CONTROLLED CO SUB 2 LASER.
J. M. Hoffman, and F. W. Bingham. Nov 73, 68p
Contract AT(29-1)-789

Descriptors: (*Lasers, *Electron beams), Carbon dioxide, Cathodes, Oscillators, Switches, Time dependence.

For abstract, see NSA 29 05, number 12487.

20F. Optics

AD-774 935/1GA PC$3.25/MF$1.45
Nebraska Univ Lincoln Dept of Electrical Engineering
APPLICATIONS OF 'SLOW' MODES FOR ACTIVE ELEMENTS IN INTEGRATED OPTICS.
Annual rept. 1 Jan-31 Dec 73,
Alvin B. Buckman. 31 Dec 73, 42p
Contract N00014-70-A-1235-0002

Descriptors: *Waveguides, *Photoconductors, Bolometers, Lead compounds, Iodides, Optical properties, Laser beams, Thin films, Radiation effects.
Identifiers: *Optical waveguides, Perylene, Lead iodide.

Studies of 'slow' guided modes on partially metallic, multifilm waveguides show that, while losses with such modes are too large (1/e decay distances of 100 wavelengths or less) to use these devices as integrated modulators, their unique feature of high field concentration in a very thin metal film makes them attractive as integrated optical bolometers. Multifilm, all-dielectric waveguides can increase the efficiency of integrated optical modulators by at least 60%. Films evaporated from PbI2 are found to be 'damaged' by Ar ion laser radiation at power densities as low as 50 mw/sq cm, for exposures of about one hour. The damage takes the form of a refractive index change of the order of 1-10%, and appears permanent. (Author)

AD-775 017/7GA PC$5.50/MF$1.45
Naval Postgraduate School Monterey Calif
WIDE BAND ANALOG SIGNAL PROPAGATION IN A FIBER OPTIC SYSTEM.
Master's thesis,
Robert Dean Stolt. Mar 74, 41p

Descriptors: *Fiber optics transmission lines, *Light transmission, Light emitting diodes, Photodiodes, Infrared radiation, Semiconductor lasers, Gallium arsenide lasers, Infrared lasers, Analog systems, Broadband, Theses.
Identifiers: Optical waveguides.

State of the art advances in fiber optics have reached the point at which modulated light signals can be transmitted by means of a fiber optic bundle and subsequently detected. A system capable of modulating a light emitting diode with wide band analog signals, transmission through a fiber optic bundle, and subsequent detection is investigated. Tests are conducted to determine frequency response, linear dynamic range, saturation levels, minimum discernible signal, noise figure, and spectrum characteristics of the system. As a result of the investigation, it is determined that the system is suitable for transmission of information to tape recorders from receiver systems and is capable of other analog information applications where signal frequencies do not exceed seven megahertz. (Author)

AD-775 027/6GA PC$7.75/MF$1.45
Naval Postgraduate School Monterey Calif
AN EXPERIMENT TO MEASURE LASER BEAM WANDER AND BEAM SPREAD IN THE MARINE BOUNDARY LAYER NEAR SHORE.
Master's thesis,
David Albert Beall. Dec 73, 94p

Descriptors: *Laser beams, *Marine atmospheres, Turbulent boundary layer, Atmospheric disturbances, Light transmission, Variations, Analog to digital converters, Computer programs, FORTRAN, Theses.
Identifiers: Monterey Bay, Helium neon lasers.

A system to measure laser beam wander and beam spread in the atmosphere over the ocean has been designed, constructed, and tested. The apparatus employed a high resolution scanning telescope with a potential for use in a broad range of visual and infra-red wavelengths, and with the ability to measure beam wander and beam spread variations on the order of a few microradians in angle of incidence. Three successful trials with a propagation path over the southern end of Monterey Bay were conducted. Data was processed using analog and digital computers. RMS values of beam wander from 4.6 to 30.2 microradians were observed. (Author)

AD-775 067/2GA PC$7.00/MF$1.45
Hughes Research Labs Malibu Calif
SEMIANNUAL TECHNICAL REPT. NO. 2, JAN-JUN 73,
G. Sanjiv Kamath, Amnon Yariv, Michael Barnoski, Kyohei Sakuda, and Victor Evtuhov. Aug 73, 78p AFCRL-TR-73-0713
Contract F19628-72-C-0322, ARPA Order-2074
See also Semiannual technical rept. no. 1, AD-763 101.

Descriptors: *Semiconducting films, *Epitaxial growth, *Waveguides, Gallium arsenides, Aluminum compounds, Thin films, Infrared radiation, Coherent radiation, Light transmission.
Identifiers: *Optical waveguides, Aluminum arsenides.

The objectives of this contract are to study and analyze the propagation, attenuation, and modulation of coherent optical waves in thin film waveguides, in particular epitaxial semiconductor structures at a wavelength of 8500A, to determine the parameters controlling the solution regrowth epitaxy of the Ga(1-x)Al(x)As system, to study the influence of the index discontinuity and semiconductor carrier concentration on optical properties, and to develop the elementary optical device elements. The present program may be viewed as consisting of the following elements: (1) establishment of epilayer material and structure requirements from the device point of view, (2) development of materials growth techniques, (3) materials evaluation, and (4) device analysis and fabrication techniques.

AD-775 221/5GA PC$6.25/MF$1.45
United Aircraft Research Labs East Hartford Conn
EFFECTS OF PARTICULATE MATTER ON ATMOSPHERIC PROPAGATION OF CO2 LASER RADIATION.
Final rept. 1 Jul 72-30 Jul 73,
David C. Smith, Robert T. Brown, Frederick G. Gebhardt, and Paul J. Berger. 30 Jul 73, 64p Rept no. UARL-M921503-3
Contract N00014-72-C-0469
See also report dated Jan 73, AD-775 222.

Descriptors: *Laser beams, *Atmospheres, Carbon dioxide lasers, Infrared radiation, Aerosols, Particulates, Absorption(Physical), Gas breakdown, Thermal blooming.
Identifiers: *Atmospheric attenuation.

The influence of aerosols, or particulates, on thermal blooming and gas breakdown of 10.6 micrometer wavelength radiation was measured. When par-

ticles are irradiated with high intensity pulsed CO2 laser beams, gas breakdown is initiated and the plasma formed limits the propagation of the beam. Experimental measurements of the threshold for ionization of single particles electrodynamically suspended at the focus of a beam was measured. Streak photographs of the plasma expansion and schlieren studies are also reported. A theoretical analysis of solid particles laser radiation interaction indicates that the mechanism leading to breakdown is superheating of the particle material with subsequent ionization of the solid or of the material directly adjacent to the solid. (Modified author abstract)

AD-775 222/3GA PC$5.25/MF$1.45
United Aircraft Research Labs East Hartford Conn
EFFECTS OF PARTICULATE MATTER ON ATMOSPHERIC PROPAGATION OF CO2 LASER RADIATION.
Semi-annual rept. 1 Jul-31 Dec 72,
David C. Smith, Robert T. Brown, Frederick G. Gebhardt, and Paul J. Berger. 31 Jan 73, 44p Rept no. UARL-M921503-2
Contract N00014-72-C-0469
See also report dated 30 Jul 73, AD-775 221.

Descriptors: *Laser beams, *Atmospheres, Carbon dioxide lasers, Infrared radiation, Aerosols, Particulates, Absorption(Physical), Gas breakdown, Thermal blooming, Vaporization.
Identifiers: *Atmospheric attenuation.

The two main nonlinear propagation problems encountered by high power CO2 laser radiation in the atmosphere are gas breakdown and thermal blooming. The influence of particulate matter on gas breakdown and also on thermal blooming was investigated. Typical atmospheric conditions contain approximately 1000 particles/cc. The presence of these particles in the air path of a high power laser beam can dramatically influence the propagation of the beam. This is illustrated by a photograph which shows particles being vaporized and ionized by a high power pulsed CO2 laser beam. The plasma balls generated not only attenuate the laser radiation, but they also act as scattering centers with completely different scattering characteristics than the original particles. The hot vapor can also act as a thermal source which could cause self-induced thermal distortion of subsequent laser pulses.

AD-775 373/4GA PC$4.00/MF$1.45
Ohio State Univ Columbus Electroscience Lab
CALCULATED ABSORPTION COEFFICIENTS FOR DF LASER FREQUENCIES.
Technical rept.,
R. K. Long, F. S. Mills, and G. L. Trusty. Nov 73, 78p Rept no. ESL-3271-7 RADC-TR-73-389
Contract F30602-72-C-0016, ARPA Order-1279

Descriptors: *Laser beams, *Marine atmospheres, *Absorption(Physical), Atmosphere models, Nitrogen oxides, Methane, Carbon dioxide, Water vapor, Nitrogen, Transmittance, Gas lasers.
Identifiers: *Deuteruim fluoride lasers, *Atmospheric attenuation.

The report presents calculations of DF laser absoprtion coefficients for the Mid-Latitude Summer sea level atmospheric model. The individual gases which cause the absorption at each laser wavelength are identified. Results are compared with those previously published by R. A. McClatchey. The calculated results are being used to guide the experimental measurement program. (Author)

AD-775 400/5GA PC$6.00/MF$1.45
Ilc Technology Inc Sunnyvale Calif
OPTICAL PUMPS FOR LASERS. VOLUME I.
Final rept. 17 May 71-16 Jul 72,
Lowell Noble. Oct 73, 40p* Rept no. R-ILC-72-32 ECOM-0239-1-F-71
Contract DAAB07-71-C-0239
See also report dated Aug 72, AD-751 212.

Descriptors: *Flash lamps, *Xenon lamps, *Krypton lamps, *Optical pumping, *Neodymium lasers, Yttrium aluminum garnet, Ultraviolet lamps, Lithium fluorides, Yttrium compounds, Efficiency, Life(Durability), Performance(Engineering).
Identifiers: *YAG lasers, YLF lasers, Holmium lasers, Lithium tetrafluoroyttriate.

The objective of this program was to increase the efficiency and reproducibility of optical pumps for Nd:YAG lasers both when new and after 1 million or 10 million pulses. Efficiency was increased by using smaller bore diameters (to 2.5 mm), higher pressures, krypton gas at 10 J, pulse lengths near 100 microsec, cerium-doped quartz envelopes, and a simmer current. Operation with a simmer current increased useful light output by 25% and reduced pulse-to-pulse variability from 0.43% to 0.12%. Lamp life, reproducibility, and efficiency were studied as functions of: precision control of bore diameter, the use of a simmer discharge, the use of cerium-doped quartz envelopes, the employment of fluorescent dye solutions, color center formation, and cooling techniques. (Modified author abstract)

AD-775 409/6GA PC$3.25/MF$1.45
Army Electronics Command Fort Monmouth N J
THE SPECTRUM OF LASER-INDUCED TURBULENCE,
Chan Mou Tchen, and Edward Collett. Feb 74, 28p Rept no. ECOM-5518

Descriptors: *Laser beams, *Heating, *Atmospheres, Turbulence, Equations of motion, Atmospheric motion.

The structure of turbulence as induced by the propagation of a high energy laser beam in a fluid is investigated. An analytical theory is developed predicting the spectral laws of temperature fluctuations. The theory involves a hierarchy of equations, which is closed by the method of cascade, as has been developed and applied by Tchen to hydrodynamic and plasma turbulences. The inertia and dissipation subranges are found to follow a modified Kolmogorov law and a modified -13/3 power law, respectively. The critical wavenumber separating the two subranges has been determined to occur at a lower wavenumber than that in the velocity spectrum. In addition, the magnitude of the inertia spectrum is increased by the laser beam as a result of the enhanced conduction. The parameters and the numerical coefficients entering into the spectrum are also determined analytically. (Author)

AD-775 457/5GA PC$3.25/MF$1.45
Ballistic Research Labs Aberdeen Proving Ground Md
OBLIQUE DIFFRACTION AND ANALYSIS OF CURVED DIFFRACTION GRATING STRAIN GAGES.
Memorandum rept.,
Gordon L. Filbey, Jr. Feb 74, 43p Rept no. BRL-MR-2351

Descriptors: *Strain gages, *Diffraction gratings, Tubes, Shear properties, Strain(Mechanics), Plastic properties.

Analysis is presented for the new application of diffraction grating strain gages to the measurement of dynamic shear strain during torsional wave propagation in hollow tubes. The problem of oblique diffraction of light from curved diffraction gratings is solved in general. Corrective measures were discovered which minimize the undesirable effects arising from the complex grating curvature. This report is the first of three in a series that will treat the measurement of finite amplitude, dynamic torsional strain waves in hollow tubes. From these studies, important dynamic material parameters may be inferred. The second report is to discuss an analytical sensitivity study of real effects which occur with use of this gage, including rigid rotation of the tube, lateral and vertical displacements, and calibration procedures. The third report will present results obtained from candidate dynamic tests. (Author)

AD-775 502/8GA Reprint
Army Electronics Command Fort Monmouth N J
EFFECT OF NEUTRON- AND GAMMA-RADIATION ON GLASS OPTICAL WAVEGUIDES,
Robert D. Maurer, Ernst J. Schiel, Stanley Kronenberg, and Robert A. Lux. 16 May 73, 4p
Availability: Pub. in Applied Optics, v12 n9 p2024-2026 Sep 73.

Descriptors: *Fiber optics transmission lines, *Glass, *Radiation effects, Light transmission, Infrared radiation, Attenuation, Neutrons, Gamma rays, Nuclear radiation.
Identifiers: *Optical waveguides.

Multimode glass optical waveguides with very low attentuation (4 dB/km) have been made by laboratory techniques. Since further research to reduce this already low absorption is no longer of primary interest, efforts have been directed toward other desirable properties of optical waveguides. Among these is the resistance to the environmental hazard of nuclear (neutron and gamma) radiation.

AD-775 503/6GA Reprint
Army Electronics Command Fort Monmouth N J
ATMOSPHERIC TRANSMISSION FROM A 4-PI LIGHT SOURCE TO A 2-PI RECEIVER,
Israel Cantor. 18 Oct 72, 15p
Availability: Pub. in Applied Optics, v12 n7 p1482-1495 Jul 73.

Descriptors: *Light transmission, *Atmospheres, Light scattering, Aerosols, Radiative transfer, Monte Carlo method, Thermal radiation, Nuclear explosions, Airburst, Mathematical models.
Identifiers: Atmospheric attenuation, Atmospheric scattering.

The survey report points out the progress and insufficiencies in the assessment and prediction of atmospheric effects on thermal radiation from an effective point source in the troposphere to a 2-pi sr receiver at the ground. Major findings of investigators during the past two decades are summarized, which also provide additional conclusions. Complicated transmission problems can, furthermore, be treated theoretically by assuming model type atmospheres and solving the radiation transfer equation by an available technique such as the Monte Carlo method. Some of the major results of this method are also presented. (Author)

AD-775 506/9GA Reprint
Army Electronics Command Fort Monmouth N J
MUTUAL COHERENCE FUNCTION OF A FINITE OPTICAL BEAM AND APPLICATION TO COHERENT DETECTION,
R. F. Lutomirski, and R. G. Buser. 23 Jun 72, 9p
Availability: Pub. in Applied Optics, v12 n9 p2153-2160 Sep 73.

Descriptors: *Laser beams, *Atmospheres, Coherence, Refractive index, Correlation techniques, Functions(Mathematics).
Identifiers: Coherence functions.

The mutual coherence function of a finite laser beam propagating through a random medium is calculated from the extended Huygens principle. Formulas are presented for the transverse coherence from an arbitrarily truncated forced Gaussian beam. Expressions are derived of a modified Kolmogorov spectrum for the refractive index fluctuations and for the case of nonuniform turbulence. The formalism is used to derive the conditions under which instantaneous reciprocity exists between a transmitter and receiver in a coherent detection system. It is also shown that a maximum useful transmitter (as well as receiver) diameter exists for computing the average normalized signal-to-noise ratio of this system. This maximum dimension is the smaller of the turbulence-

induced coherence length and a Fresnel zone. (Author)

AD-775 576/2GA PC$3.75/MF$1.45
United Aircraft Research Labs East Hartford Conn
RESEARCH INVESTIGATION OF LASER LINE PROFILES (PICOSECOND LASER PULSES).
Final rept. 1 Aug 66-28 Feb 74,
William H. Glenn. 1 Mar 74, 60p Rept no. UARL-N920479-44
Contract N00014-66-C-0344, ARPA Order-1806
See also AD-689 548.

Descriptors: *Laser beams, *Light pulses, *Optical radar, Neodymium lasers, Mode locked lasers, Infrared lasers, Radar signals, Signal processing, Doppler effect.

The report discusses the application of picosecond optical pulses to high resolution imaging optical radar. A novel type of signal processing is described. An extensive bibliography of previous work on this contract is included. (Author)

COM-74-50156/0GA Not available NTIS
National Bureau of Standards, Washington, D.C.
CHOPPER-STABILIZED NULL RADIOMETER BASED UPON AN ELECTRICALLY CALIBRATED PYROELECTRIC DETECTOR.
Final rept.,
Jon Geist, and W. R. Blevin. 1973, 4p
Pub. in Applied Optics, v12 n11 p2532-2535 Nov 73.

Descriptors: *Radiometrers, Design, Performance evaluation, Calibrating, Power measurement.

The authors describe a new type of radiometric system that combines the high-accuracy characteristics of electrical calibration and null detection with the noise and background discrimination of chopper-stabilized, synchronous detection. The authors start by outlining those characteristics required for high accuracy and those required for good noise discrimination. Next it is shown that these requirements are mutually inconsistent for certain types of detectors (thermopiles), but that they can all be well satisfied by electrically-calibrated pyroelectric detectors. Then the special requirements for a chopper-stabilized null radiometer is discussed, including wave-form independent, lock-in detection. The performance of a system is described.

N74-15100/2GA PC$4.50/MF$1.45
Rensselaer Polytechnic Inst., Troy, N.Y.
MASS SPECTROMETRY AND INHOMOGENEOUS ION OPTICS.
Final Report.
F. A. White. Nov 73, 132p NASA-CR-2253
Contract NGL-33-018-053

Descriptors: *Ion distribution, *Ion motion, *Mass spectrometers, Copper, Inhomogeneity, Ion sources, Mass spectroscopy, Metal ions, Rain.

For abstract, see STAR 1206

PATENT-3 782 835 Not available NTIS
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
OPTICAL INSTRUMENTS.
Patent.
I. R. Abel. Patented 1 Jan 74, 6p NASA-CASE-MSC-14096-1,
Misc-Filed 10 Apr. 1972 Supersedes N73-22388 (11 - 13, p 1529). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Imaging techniques, *Optical paths, *Optical scanners, Mirrors, Optical properties, *Patents, Systems analysis.

A wide angle, low focal ratio, high resolution, catoptric, image plane scanner is described. The scanner includes the following features: (1) a reflective improvement on the Schmidt principle, (2) a polar line scanner in which all field elements are brought to and corrected on axis, and (3) a scanner arrangement in which the aperture stop of the system is imaged at the center of curvature of a spherical primary mirror. The system scans are a large radial angle and an extremely high rate of speed with relatively small scanning mirrors. Because the system is symmetrical about the optical axis, the obscuration is independent of the scan angle.

PB-229 338/9GA PC$4.00/MF$1.45
University of Southern California, Los Angeles. Dept. of Electrical Engineering.
SCATTERING AND TRANSMISSION MATRICES OF PARTIALLY POLARIZED RADIATION IN A RAYLEIGH ATMOSPHERE BOUNDED BY A SPECULAR REFLECTOR.
Technical rept.,
Sueo Ueno. Feb 73, 17p TR-RB73-9
Contract AT(04-3)-113, Grant NSF-GP-29049

Descriptors: *Rayleigh scattering, *Light transmission, *Integral equations, *Cauchy problem, Digital computers, Computation, Polarized electromagnetic radiation.

In the report the author shows how to get a Cauchy system for the scattering and transmission matrices of the azimuth-independent term of partially polarized light in accordance with Rayleigh scattering in a homogeneous atmosphere bounded by a specular reflector. This set of integro-differential equations for the scattering and transmission matrices is suitable for numerical computation by high-speed digital computer.

20G. Particle Accelerators

AECL-4600 PC$3.00/MF$1.45
CONCERNING A HIGH CURRENT COLLECTIVE ACCELERATOR.
I. V. Chuvilo, I. M. Kapchinskii, D. G. Koshkarev, P. R. Zenkevich, and V. K. Plotnikov. Oct 73, 14p
CONF-720952-8
Translated by J.A. Hulbert from symposium on collective methods of acceleration, Dubna, USSR, 27--30 September 1972. U.S. Sales Only.

Descriptors: (*Electron-ring accelerators, *Planning), Gev range 01-10, Protons, Specifications.

For abstract, see NSA 29 05, number 10800.

ANL/CTR-73-2 PC$3.00/MF$1.45
Argonne National Lab., Ill. (Usa).
ACCELERATOR BE-TARGET NEUTRON SOURCES FOR THE CTR MATERIALS PROGRAM.
P. J. Persiani. Oct 73, 14p
Contract W-31-109-eng-38

Descriptors: (*Neutron sources, *Targets), Accelerator facilities, Beryllium, Cyclotrons, Deuteron reactions, Mev range 10-100, Neutron spectra, Nuclear reaction yield.

For abstract, see NSA 29 05, number 10859.

BARC-692 PC$6.50/MF$1.45
Bhabha Atomic Research Centre, Bombay (India). Nuclear Physics Div.
VAN DE GRAAFF LABORATORY PROGRESS REPORT.
T. P. David. 1973, 86p
U.S. Sales Only.

Descriptors: (*Nuclear physics, *Research programs), (*Van de graaff accelerators, Research programs), India, Leading abstract, Operation.

For abstract, see NSA 29 05, number 10801.

BNL-18338 PC$3.00/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
WAKE FIELD PRODUCED BY A PARTICLE IN THE PRESENCE OF CONDUCTIVE PLATES: A VEHICLE FOR THE EXCITATION OF THE COUPLED BETATRON-SYNCHROTRON INSTABILITIES.
A. G. Ruggiero. 22 May 73, 11p

Descriptors: (*Adone, *Beam dynamics), Betatron oscillations, Electrodes, Instability.

For abstract, see NSA 29 05, number 10849.

BNL-18356 PC$3.00/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
BUNCHED BEAM STABILITY IN PROTON--PROTON STORAGE RINGS.
M. Month. 8 Nov 73, 5p

Descriptors: (*Storage rings, *Beam dynamics), Energy dependence, Oscillations, Protons, Rf systems, Stability.

For abstract, see NSA 29 05, number 10850.

BNL-18361 PC$3.00/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
CORRECTION COIL FOR RANDOM MAGNETIC FIELD ERRORS IN A SUPERCONDUCTING STORAGE ACCELERATOR.
G. Parzen. 12 Nov 73, 10p

Descriptors: (*Storage rings, *Magnetic fields), Corrections, Magnet coils, Superconducting magnets.

For abstract, see NSA 29 05, number 10851.

BNL-18380 PC$3.00/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
COS THETA DIPOLE OF 12-CM APERTURE.
P. F. Dahl. 20 Nov 73, 6p

Descriptors: (*Beam bending magnets, *Magnetic fields), Errors, Multipoles.

For abstract, see NSA 29 05, number 10840.

CERN-73-16 PC$8.25/MF$1.45
European Organization for Nuclear Research, Geneva (Switzerland).
TRANSPORT: A COMPUTER PROGRAM FOR DESIGNING CHARGED PARTICLE BEAM TRANSPORT SYSTEMS.
K. L. Brown, F. Rothacker, D. C. Carey, and C. Iselin. 15 Nov 73, 121p
U.S. Sales Only.

Descriptors: (*Computer codes, *T codes), (*Beam transport, Computer codes), (*Charged particles, Beam transport), Design, Electromagnetic lenses.

For abstract, see NSA 29 05, number 10841.

JINR-P13-7512 PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Problems.
CYCLOTRON MESON BEAM CONTAMINATION.
A. V. Kuptsov, G. I. Smirnov, and D. M. Khazins. 1973, 8p
In Russian. U.S. Sales Only.

Descriptors: (*Synchrocyclotrons, *Meson beams), Electron beams, Monte carlo method, Muon beams, Secondary beams.

For abstract, see NSA 29 05, number 10861.

JINR-P16-7335 PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr).

SHIELDING FROM THE NEUTRONS GENERATED IN TARGETS BY PROTONS WITH THE ENERGY FROM 25 TO 400 MEV.
M. M. Komochkov. 1973, 20p
In Russian. U.S. Sales Only.

Descriptors: (*Accelerators, *Shielding), Mev range 10-100, Mev range 100-1000, Neutrons, Protons, Radiation protection, Targets.

For abstract, see NSA 29 05, number 10813.

JINR-P9-7261 PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Computing Techniques and Automation.
LIMITS OF EFFECTIVE ACCELERATION FIELDS IN ERA.
V. G. Makhan'kov, and M. G. Meshcheryakov. 1973, 8p
In Russian. U.S. Sales Only.

Descriptors: (*Electron-ring accelerators, *Electromagnetic fields), Mathematical models.

For abstract, see NSA 29 05, number 10844.

JINR-P9-7449 PC$3.25/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Problems.
STUDY OF BEAM EXTRACTION IN THE ELECTRON MODEL OF THE RING CYCLOTRON.
V. P. Dmitrievskii, B. I. Zamolodchikov, N. L. Zaplatin, G. P. Leshchenko, and D. L. Novikov. 1973, 24p
In Russian. U.S. Sales Only.

Descriptors: (*Cyclotrons, *Beam extraction), Mockup.

For abstract, see NSA 29 05, number 10836.

LBL-2418 PC$3.00/MF$1.45
California Univ., Berkeley (Usa). Lawrence Berkeley Lab.
LBL SUPERCONDUCTING ACCELERATOR DEVELOPMENTS.
W. S. Gilbert. Nov 73, 19p CONF-731115-5
Contract W-7405-eng-48

Descriptors: (*Superconducting magnets, *Research programs), (*Synchrotrons, Superconducting magnets), Beam bending magnets, Beam transport, Dipoles, Gev range 01-10, Protons, Quadrupoles.

For abstract, see NSA 29 05, number 10814.

LBL-2422 PC$3.00/MF$1.45
California Univ., Berkeley (Usa). Lawrence Berkeley Lab.
PEP PROJECT STATUS.
G. Lambertson. 1 Nov 73, 5p CONF-731115-6
Contract W-7405-Eng-48

Descriptors: (*Storage rings, *Planning), Colliding beams, Electron beams, Positron beams, Proton beams.

For abstract, see NSA 29 05, number 10852.

LBL-2601 PC$3.00/MF$1.45
California Univ., Berkeley (Usa). Lawrence Berkeley Lab.
EXPERIMENTAL SUPERCONDUCTING ACCELERATOR RING.
G. Lambertson. 1 Nov 73, 14p CONF-731115-7
Contract W-7405-eng-48

Descriptors: (*Synchrotrons, *Planning), (*Storage rings, Planning), Gev range 01-10, Protons, Superconducting magnets.

For abstract, see NSA 29 05, number 10853.

LPS-136 PC$3.00/MF$1.45
Cornell Univ., Ithaca, N.Y. (Usa). Lab. Of Plasma Studies.
HIGH POWER ELECTROSTATIC ION ACCELERATORS.
S. Jr. Humphries. Oct 73, 19p
Contract AT(11-1)-3170

Descriptors: (*Electrostatic accelerators, *Operation), Field emission, Ion beams, Ion sources, Kev range 100-1000, Kilo amp beam currents, Mev range 01-10, Planning, Plasma.

For abstract, see NSA 29 05, number 10806.

NP-19890 PC$4.25/MF$1.45
Jyvaeskylae Univ. (Finland). Dept. Of Physics.
CARRIER-LOADED HELIUM-JET TRANSPORT METHOD. RESEARCH REPORT NO. 12/1973.
J. Aeystoe, P. Puumalainen, and K. Valli. Jun 73, 43p
U.S. Sales Only.

Descriptors: (*Reaction product transport systems, *Performance), Efficiency, Helium, Jets, On-line systems, Operation, Radioisotopes, Recoils.

For abstract, see NSA 29 05, number 10862.

RL-73-109 PC$3.75/MF$1.45
Science Research Council, Chilton (Uk). Rutherford High Energy Lab.
DESIGN STUDY OF IRON CONFIGURATION FOR BEAM LINE DIPOLES (SUPERCONDUCTING).
A. D. McInturff. Sep 73, 34p
U.S. Sales Only.

Descriptors: (*Beam bending magnets, *Shielding), (*Superconducting magnets, *Specifications), Configuration, Iron.

For abstract, see NSA 29 05, number 10816.

RL-73-112 PC$3.00/MF$1.45
Science Research Council, Chilton (Uk). Rutherford High Energy Lab.
LOW EMITTANCE LOW HALO EXTRACTED PROTON BEAM FOR NIMROD.
F. Atchison, and J. Butterworth. Oct 73, 18p
U.S. Sales Only.

Descriptors: (*Nimrod, *Accelerator facilities), Beam extraction, Beam optics, Collimators, Proton beams.

For abstract, see NSA 29 05, number 10868.

RL-73-117 PC$3.00/MF$1.45
Science Research Council, Chilton (Uk). Rutherford High Energy Lab.
MULTI-MODE EXCITATION OF A LOSSY LINE BY A PULSED BEAM.
J. D. Lawson. 1973, 6p EPIC/MC-35
U.S. Sales Only.

Descriptors: (*Storage rings, Cavity resonators), (*Cavity resonators, *Energy losses), Beam currents, Beam dynamics, Beams, Excitation, Frequency dependence, Power supplies, Power transmission, Pulses, Rf systems.

For abstract, see NSA 29 05, number 10854.

RL-73-127 PC$3.00/MF$1.45
Science Research Council, Chilton (Uk). Rutherford High Energy Lab.
70-MEV INJECTOR ALIGNMENT PROPOSALS. PART 2. LEDS AND DC GUN ALIGNMENT.
R. Lascelles. Oct 73, 5p
U.S. Sales Only.

Descriptors: (*Nimrod, *Beam injection), Alignment, Mev range 10-100.

For abstract, see NSA 29 05, number 10837.

RL-73-134 PC$3.00/MF$1.45
Science Research Council, Chilton (Uk). Rutherford High Energy Lab.
70-MEV INJECTOR ALIGNMENT PROPOSALS. PART 3. ALIGNMENT OF FLOOR DATUM AND HEIGHT REFERENCE POINTS.
H. Jarvis. Nov 73, 8p
U.S. Sales Only.

Descriptors: (*Nimrod, *Beam injection), Alignment, Mev range 10-100.

For abstract, see NSA 29 05, number 10838.

RL-73-96 PC$3.25/MF$1.45
Science Research Council, Chilton (Uk). Rutherford High Energy Lab.
CONSTANT PERIMETER END.
H. I. Rosten. Sep 73, 24p
U.S. Sales Only.

Descriptors: (*Magnet coils, *Mathematical models), Computer codes, Configuration, Electromagnets, Magnetic dipoles, Magnetic fields.

For abstract, see NSA 29 05, number 10815.

RL-73-98 PC$4.00/MF$1.45
Science Research Council, Chilton (Uk). Rutherford High Energy Lab.
MAGNETIC FIELD DUE TO A CURRENT CARRYING HELICAL BLOCK OF RECTANGULAR CROSS SECTION.
H. I. Rosten. Sep 73, 37p
U.S. Sales Only.

Descriptors: (*Superconducting magnets, *Magnetic fields), (*Computer codes, *B codes), Accelerators, Analytical solution, Beam transport, Dipoles, Electric currents, Fortran, Helical configuration, Integral equations, Magnet coils, Numerical solution, Rectangular configuration.

For abstract, see NSA 29 05, number 10845.

SLAC-Trans-160 PC$3.00/MF$1.45
European Organization for Nuclear Research, Geneva (Switzerland).
FUNCTIONING AND OPERATIONS OF THE I.S.R. FAST-VALVE CONTROL SYSTEM.
Ph. Rochat, and J. Delfosse. Oct 73, 6p
Translated from French Information Bulletin No. 12, July 31, 1973.

Descriptors: (*Cern isr, *Equipment protection devices), (*Vacuum systems, Equipment protection devices), Control systems, Operation, Valves.

For abstract, see NSA 29 05, number 10855.

SLAC-166 PC$5.45/MF$1.45
Stanford Linear Accelerator Center, Calif. (Usa).
ELECTRON TRAJECTORY PROGRAM.
W. B. Herrmannsfeldt. Sep 73, 83p
Contract AT(04-3)-515

Descriptors: (*Electrons, *Trajectories), (*Beam transport, *Computer codes), Electromagnetic lenses, Electrostatic lenses, Focusing, Fortran, Ibm computers.

For abstract, see NSA 29 05, number 10846.

20H. Particle Physics

AECL-4595 PC$6.50/MF$1.45
Atomic Energy of Canada LTD., Chalk River, Ontario. Chalk River Nuclear Labs.
PHYSICS DIVISION PROGRESS REPORT, APRIL 1--JUNE 30, 1973.
Jul 73, 87p PR-P-98
U.S. Sales Only.

Descriptors: (*Nuclear physics, *Research programs), (*Radiation detectors, Research programs), Chalk river nuclear labs, Computers, Heavy ion reactions, Mathematics, Programming.

For abstract, see NSA 29 05, number 11414.

AWRE-O-40-73 PC$5.50/MF$1.45
Ukaea Weapons Group, Aldermaston. Atomic Weapons Research Establishment.
GUIDE TO GALAXY 3*. PART 1.
J. A. Price. Nov 73, 69p
U.S. Sales Only.

Descriptors: (*Computer codes, *G codes), (*Multigroup theory, Computer codes), (*Neutron transport, Computer codes), Cross sections, Data, Data processing, Energy spectra, Fortran, Group constants, Ibm computers, Neutron spectra, Ukaea.

For abstract, see NSA 29 05, number 11343.

BARC-694 PC$12.25/MF$1.45
Bhabha Atomic Research Centre, Bombay (India).
ANNUAL REPORT OF THE NUCLEAR PHYSICS DIVISION FOR THE PERIOD ENDING DECEMBER 1972.
V. S. Ramamurthy, and A. P. Roy. 1973, 202p
U.S. Sales Only.

Descriptors: (*Nuclear physics, *Research programs), (*Crystallography, Research programs), Fission, India, Neutron diffraction, Nuclear reactions, Purnima reactor, Spectroscopy, Van de graaff accelerators.

For abstract, see NSA 29 05, number 11417.

BMFT-FBK-73-22 PC$10.75/MF$1.45
Mainz Univ. (F.R. Germany). Inst. Fuer Anorganische Chemie und Kernchemie.
ANNUAL REPORT, 1972.
M. Weber. Aug 73, 174p
In German. U.S. Sales Only.

Descriptors: (*Triga-2-mainz reactor, *Performance), (*Seconds living radioisotopes, *Isotope production), (*Radiochemistry, *Research programs), (*Nuclear chemistry, Research programs), German federal republic, Operation, Beta-minus decay, Fission products, Fission yield, Gamma spectroscopy, Nuclear physics, Separation processes.

For abstract, see NSA 29 05, number 11473.

BMFT-FBK-73-25 PC$8.50/MF$1.45
Hamburg Univ. (F.R. Germany). 2. Inst. Fuer Experimentalphysik.
ANNUAL REPORT, 1972.
Sep 73, 130p
In German. U.S. Sales Only.

Descriptors: (*Nuclear physics, *Research programs), (*High energy physics, Research programs), German federal republic, Angular correlation, Hyperfine structure, Moessbauer effect, Nuclear magnetic moments, Atomic fluorescence spectroscopy, Photoelectron spectroscopy, Semiconductor materials, Synchrotron radiation, Nuclear reactions.

For abstract, see NSA 29 05, number 11380.

BNL-18366 PC$3.00/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
TRENDS IN NUCLEAR PHYSICS: WHAT CAN WE LEARN FROM HIGH ENERGY INTERACTIONS.
M. Goldhaber. 1973, 8p CONF-730815-7

Descriptors: Elementary particles, Hadronic atoms, Hypernuclei, N*resonances, Nuclear properties, Nuclear structure.

For abstract, see NSA 29 05, number 11559.

BUP-53 PC$6.25/MF$1.45
Bergen Univ. (Norway). Dept. Of Physics.
PARTICLE PRODUCTION AT THE ISR.
E. Lillethun. Jul 73, 82p
U.S. Sales Only.

Descriptors: (*Proton-proton interactions, *Particle production), (*Proton-antiproton interactions, Particle production), Angular distribution, Antideuterons, Antiprotons, Cern isr, Correlations, Deuterons, Elastic scattering, Heavy leptons, Inclusive interactions, Inelastic scattering, Kaons minus, Kaons plus, Lectures, Magnetic monopoles, Pions minus, Pions neutral, Pions plus, Protons, Quarks, Reviews, Total cross sections.

For abstract, see NSA 29 05, number 11211.

CEA-CONF-2407 PC$3.25/MF$1.45
Cea Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France). Dept. De Physique Nucleaire.
ANALYSIS OF THE EFFECTIVE CAPTURE CROSS SECTION AND THE INELASTIC SCATTERING OF THE ISOTOPES EXP 99 TC, EXP 103 RH, EXP 127 I, EXP 133 CS, AND EXP 139 LA BETWEEN 1 KEV AND 2 MEV.
J. Krebs. 1973, 25p CONF-730538-3
In French. U.S. Sales Only.

Descriptors: (*Rhodium 103, *Energy levels), (*Iodine 127, Energy levels), (*Cesium 133, Energy levels), (*Lanthanum 139, Energy levels), Level widths, Parity, Spin, Technetium 99, Cross sections, Excitation functions, Fast neutrons, Inelastic scattering, Intermediate neutrons, Kev range 01-10, Kev range 10-100, Kev range 100-1000, Mev range 01-10, Neutron reactions, Optical models, Statistical models, Capture, Cesium 134, Gamma radiation, Iodine 128, Lanthanum 140, Rhodium 104, Technetium 100, Intermediate mass nuclei.

For abstract, see NSA 29 05, number 11481.

CEA-CONF-2408 PC$3.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France). Dept. De Physique Nucleaire.
ESTIMATION OF THE EFFECTIVE CAPTURE CROSS SECTION OF IRON.
G. Le Coq, and P. Ribon. 1973, 5p CONF-730538-4
In French. U.S. Sales Only.

Descriptors: (*Iron 56, Neutron reactions), (*Iron 57, Neutron reactions), (*Iron 54, Neutron reactions), (*Neutron reactions, *Capture), Cross sections, Gamma radiation, Kev range, Iron 58, Iron 55.

For abstract, see NSA 29 05, number 11430.

CEA-CONF-2409 PC$3.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France). Dept. De Physique Nucleaire.
FRENCH ACTIVITIES IN THE FIELD OF NUCLEAR DATA.
P. Ribon. 1973, 9p CONF-730538-5
In French. U.S. Sales Only.

Descriptors: (*Nuclear physics, *Data), France, Neutron reactions.

For abstract, see NSA 29 05, number 11344.

CEA-R-4524 PC$4.25/MF$1.45
Cea Centre d'Etudes de Bruyeres-le-Chatel, 92 - Montrouge (France).
MEASUREMENT OF TOTAL NEUTRON CROSS SECTIONS OF BE, EXP 11 B, C, AL, SI, S, TI, V, NI, EXP 235 U, EXP 238 U, EXP 239 PU IN THE ENERGY RANGE 100 KEV TO 6 MEV.
J. Cabe, and M. Cance. Nov 73, 45p
In French. U.S. Sales Only.

Descriptors: (*Neutron reactions, *Total cross sections), (*Beryllium 9, Neutron reactions), (*Boron 11, Neutron reactions), (*Carbon, Neutron reactions), Aluminium 27, Kev range 100-1000, Mev range 01-10, Nickel, Plutonium 239, Silicon, Sulfur, Titanium, Uranium 235, Uranium 238, Vanadium.

For abstract, see NSA 29 05, number 11383.

CERN-73-15 PC$3.00/MF$1.45
European Organization for Nuclear Research, Geneva (Switzerland).
SCALING PROPERTIES AND THE BOUND-STATE MODEL OF PHYSICAL BARYONS.
T. D. Lee. 12 Nov 73, 17p
U.S. Sales Only.

Descriptors: (*Baryons, *Bound state), Particle models, Scale invariance, Strong interactions.

For abstract, see NSA 29 05, number 11299.

COM-74-50065/3GA Not available NTIS
National Bureau of Standards, Washington, D.C.
SYMMETRY RELATIONS AMONG PIONIZATION CROSS SECTIONS.
Final rept.,
C. A. Nelson, and David Steele. 1973, 8p
Pub. in Physical Review, D Particles and Fields, v8 n9 p2908-2915, 1 Nov 73.

Descriptors: *Pions, *Meson cross sections, Quarks, SU3 theories, Regge poles, Symmetry.

From Mueller's Regge analysis of the pionization region, symmetry relations to order S sup (-1/4) among invariant cross sections at x = 0, in which a final pion is observed, are derived. SU(3) and quark universality are assumed to relate the Regge residues at the projectile-Reggeon vertex. There is good agreement with experiment to 10-15% indicating that the approximate symmetry pattern at nonasymptotic energies is that of total cross sections.

CONF-730642-13 PC$3.00/MF$1.45
Helsinki Univ. (Finland). Research Inst. For Theoretical Physics.
NUCLEON--NUCLEON POTENTIAL THAT INCLUDES THE EFFECT OF THE DELTA (1236).
A. M. Green, and P. Haapakoski. 1973, 10p
U.S. Sales Only.

Descriptors: (*Nucleon-nucleon potential, *Delta-1236 resonances), (*Nuclear matter, *Binding energy), Coupled channel theory, Neutrons, Nucleon-nucleon interactions.

For abstract, see NSA 29 05, number 11287.

COO-1764-192 PC$3.00/MF$1.45
Minnesota Univ., Minneapolis (Usa). School of Physics and Astronomy.
RESONANCES IN HIGH-ENERGY COLLIDING LEPTON BEAMS.
J. L. Rosner. 13 Mar 73, 17p CONF-730334-10
Contract AT(11-1)-1764

Descriptors: (*Resonance particles, *Electroproduction), (*Electron-electron interactions, Resonance particles), (*Electron-positron interactions, Resonance particles), Colliding beams, Decay, Electrons, Hadrons, Meson resonances, Photon-photon interactions, Positrons, Su-6 groups, Symmetry groups.

For abstract, see NSA 29 05, number 11256.

COO-2271-19 PC$5.25/MF$1.45
Columbia Univ., New York (Usa). Dept. Of Physics.
INCLUSIVE ANNIHILATION PROCESSES IN PHI EXP 4 FIELD THEORY.
A. H. Mueller. 1973, 65p

Descriptors: (*Electron-positron interactions, *Annihilation), (*Electron-nucleon interactions, *Quantum field theory), Cross sections, Eigenvalues, Electroproduction, Hadrons, Inclusive interactions, Inelastic scattering, Light cone, Mass, Mathematical operators, Multiplicity, Scattering amplitudes, Series expansion, Singularity.

For abstract, see NSA 29 05, number 11257.

COO-2271-23 PC$4.25/MF$1.45
Columbia Univ., New York (Usa).
WEAK INELASTIC PRODUCTION AND LEPTONIC DECAYS OF HEAVY LEPTONS.
A. Soni. 1973, 44p
Contract AT(11-1)-2271

Descriptors: (*Heavy leptons, *Leptonic decay), (*Neutrino-nucleon interactions, *Inclusive interactions), Antineutrinos, Charged particles, Coupling constants, Cross sections, Differential cross sections, Energy spectra, Gev range 10-100, Gev range 100-1000, Hadrons, Inelastic scattering, Lepton-nucleon interactions, Leptons, Mass, Neutrinos, Particle production, Phase space, Polarization, Structure functions, Total cross sections.

For abstract, see NSA 29 05, number 11267.

COO-3065-56 PC$3.00/MF$1.45
Michigan Univ., Ann Arbor (Usa); Rochester Univ., N.Y. (Usa).
PRODUCTION OF GAMMA , LAMBDA EXP 0 , K/SUB S/ EXP 0 , AND ANTI LAMBDA EXP 0 IN PP COLLISIONS AT 102 GEV/C.
J. W. Chapman, J. Cooper, N. Green, B. P. Roe, and A. A. Seidl. 1973, 12p UR-457, UMBC-73-20

Descriptors: (*Proton-proton interactions, *Cross sections), (*Photons, *Particle production), (*Kaons neutral short-lived, Particle production), (*Lambda particles, Particle production), Antilambda particles, Bubble chambers, Gev range 100-1000, Inclusive interactions, Linear momentum.

For abstract, see NSA 29 05, number 11212.

COO-3065-58 PC$3.00/MF$1.45
Rochester Univ., N.Y. (Usa); Michigan Univ., Ann Arbor (Usa).
CROSS SECTIONS AND CHARGED PARTICLE MULTIPLICITIES AT 102 AND 405 GEV.
C. Bromberg, D. Chaney, D. Cohen, T. Ferbel, and P. Slattery. 1973, 11p UR-459

Descriptors: (*Proton-proton interactions, *Multiple production), Bubble chambers, Charged particles, Distribution, Gev range 100-1000, Inelastic scattering, Multiplicity, Topology, Total cross sections.

For abstract, see NSA 29 05, number 11213.

COO-3065-61 PC$3.00/MF$1.45
Rochester Univ., N.Y. (Usa). Dept. Of Physics and Astronomy.
PARTICLE MULTIPLICITIES AND CORRELATIONS AT NAL ENERGIES.
T. Ferbel. Oct 73, 18p UR-462
Contract AT(11-1)-3065

Descriptors: (*Proton-proton interactions, *Multiple production), Charged particles, Correlations, Cross sections, Inclusive interactions, Kaons neutral short-lived, Lambda particles, Mass spectra, Missing mass, Pions minus, Pions neutral, Reviews, Scale invariance, Sigma neutral.

For abstract, see NSA 29 05, number 11214.

COO-3071-37 PC$3.00/MF$1.45
Pennsylvania Univ., Philadelphia (Usa). Dept. Of Physics.
MEASUREMENTS OF NEUTRINO AND ANTINEUTRINO CROSS SECTIONS AT HIGH ENERGIES.
A. Benvenuti, D. Cline, and W. T. Ford. 25 Oct 73, 13p

Descriptors: (*Neutrino-nucleon interactions, *Total cross sections), Antineutrinos, Energy, Gev range 100-1000, Hadrons, Muon neutrinos, Muons minus, Muons plus, Particle production.

For abstract, see NSA 29 05, number 11209.

COO-3128-33 PC$3.25/MF$1.45
Brown Univ., Providence, R.I. (Usa).
REACTION STUDIES WITH FAST NEUTRONS. FINAL REPORT, FEBRUARY 1, 1951--JANUARY 31, 1972.
1973, 25p
Contract AT(11-1)-3128

Descriptors: (*Neutron reactions, *Research programs), (*Nuclear structure, Research programs), (*Nuclear reactions, Research programs), Fast neutrons, Rhode island.

For abstract, see NSA 29 05, number 11482.

COO-3525-1 PC$3.00/MF$1.45
Southeastern Massachusetts Univ., North Dartmouth (Usa).
FINAL TECHNICAL REPORT ON RESEARCH IN HIGH ENERGY PHYSICS. 1. PHOTOPRODUCTION OF PIONS. 2. COLLIDING E EXP + E EXP - BEAM PHYSICS.
Nov 72, 11p
Contract AT(11-1)-3525

Descriptors: (*Pions, *Photoproduction), (*Electron-positron interactions, *Research programs), Colliding beams.

For abstract, see NSA 29 05, number 11198.

DESY-73-34 PC$3.75/MF$1.45
Deutsches Elektronen-Synchrotron (Desy), Hamburg (F.R. Germany).
PARTON MODEL PREDICTIONS FOR TWO PARTICLE CORRELATIONS IN E EXP + E EXP - ANNIHILATION.
T. F. Walsh, and P. Zerwas. Aug 73, 35p
U.S. Sales Only.

Descriptors: (*Electron-positron interactions, *Annihilation), (*Parton model, Electron-positron interactions), Correlations, Electroproduction, Inclusive interactions, Linear momentum, Meson resonances, Mesons, Quantum numbers, Sum rules.

For abstract, see NSA 29 05, number 11258.

DESY-73/36 PC$5.25/MF$1.45
Deutsches Elektronen-Synchrotron (Desy), Hamburg (F.R. Germany).
MULTIPLICITIES, TOPOLOGICAL CROSS SECTIONS, AND SINGLE PARTICLE INCLUSIVE DISTRIBUTIONS FROM PP INTERACTION AT 12 AND 24 GEV/C.
Aug 73, 64p
U.S. Sales Only.

Descriptors: (*Proton-proton interactions, *Inclusive interactions), Antiparticles, Charged particles, Correlations, Cross sections, Differential cross sections, Energy spectra, Gev range 10-100, Kaons neutral short-lived, Lambda particles, Linear momentum, Multiplicity, Pions minus, Pions neutral, Pions plus, Protons, Sigma minus, Sigma plus, Topology, Total cross sections.

For abstract, see NSA 29 05, number 11215.

DESY-73-38 PC$3.00/MF$1.45
Deutsches Elektronen-Synchrotron (Desy), Hamburg (F.R. Germany).
T-CHANNEL SELECTION PRINCIPLES FOR ELECTROPRODUCTION OF PIONS.
G. Kramer. Aug 73, 14p
In German. U.S. Sales Only.

Descriptors: (*Pions, *Electroproduction), Absorption, Cross sections, Electron-nucleon interactions, Gev range 01-10, Photon-proton interactions, Photons, Photoproduction, Pions neutral, Polarization, Protons, Regge cuts, Regge poles, Selection rules, Virtual particles.

For abstract, see NSA 29 05, number 11259.

DESY-73-40 PC$3.50/MF$1.45
Deutsches Elektronen-Synchrotron (Desy), Hamburg (F.R. Germany).
TESTING GAUGE THEORIES IN E EXP +- E EXP - EXPERIMENTS. AN INTRODUCTION SUMMARY.
G. V. Dass. Aug 73, 29p
U.S. Sales Only.

Descriptors: (*Electron-positron interactions, *Gauge invariance), (*Electron-electron interactions, Gauge invariance), (*Weak interactions, Gauge invariance), (*Electromagnetic interactions, Gauge invariance), Heavy leptons, Neutral currents, Phi-1019 resonances.

For abstract, see NSA 29 05, number 11260.

DESY-73-42 PC$3.50/MF$1.45
Deutsches Elektronen-Synchrotron (Desy), Hamburg (F.R. Germany).
RELATIVISTIC THREE-PARTICLE PROBLEM AND HEAVY QUARKS.
R. F. Meyer. Oct 73, 27p
U.S. Sales Only.

Descriptors: (*Quarks, *Binding energy), (*Baryons, *Particle radii), Baryons, Bethe-salpeter equation, Diagrams, Field theories, Ground states, Harmonic oscillator models, Mass, Quark model, Regge trajectories, Relativistic range, Scalars, Scattering amplitudes, Three-body problem.

For abstract, see NSA 29 05, number 11244.

DESY-73-43 PC$3.00/MF$1.45
Deutsches Elektronen-Synchrotron (Desy), Hamburg (F.R. Germany).
INCLUSIVE PHOTOPRODUCTION OF PI EXP 0 MESONS AT 6 GEV.
C. Berger, G. Dick, W. Erlewein, K. Luebelsmeyer, and L. Paul. Oct 73, 17p
U.S. Sales Only.

Descriptors: (*Pions neutral, *Photoproduction), (*Photon-proton interactions, *Inclusive interactions), Cross sections, Distribution, Gev range 01-10.

For abstract, see NSA 29 05, number 11199.

EANDC-92-U PC$5.75/MF$1.45
European American Nuclear Data Committee.
SUMMARY RECORD (TECHNICAL) OF THE SIXTEENTH MEETING OF THE COMMITTEE, PARIS, FRANCE, NOVEMBER 27--DECEMBER 1, 1972.
H. Conde. 1972, 71p
U.S. Sales Only.

Descriptors: (*Nuclear physics, *Data), Meetings.

For abstract, see NSA 29 05, number 11345.

HU-TFT-73-20 PC$3.00/MF$1.45
Helsinki Univ. (Finland). Research Inst. For Theoretical Physics.
SINGULAR-CORE-INTERACTION AND ONE-PION-EXCHANGE CONSTRAINTS ON THE OFF-SHELL TWO-NUCLEON T-MATRIX.
Y. E. Kim, and A. Tubis. 1973, 11p
U.S. Sales Only.

Descriptors: Boundary conditions, Nuclear cores, Nucleon-nucleon potential, Nucleons, Ope potential, Partial waves, Phase shift, S matrix, Two-body problem.

For abstract, see NSA 29 05, number 11560.

HU-TFT-73-21 PC$4.00/MF$1.45
Helsinki Univ. (Finland). Research Inst. For Theoretical Physics.
REGGE--MUELLER VERSUS PARTON MODEL ANALYSIS OF DEEP INELASTIC REACTIONS.
M. Chaichian, S. Kitakado, W. S. Lam, and Y. Zarmi. 1973, 39p
U.S. Sales Only.

Descriptors: (*Lepton-hadron interactions, *Inclusive interactions), (*Parton model, Lepton-hadron interactions), (*Regge poles, Lepton-hadron interactions), Coupling, Distribution, Duality, Inelastic scattering, Quarks, Regge calculus, Su-3 groups.

For abstract, see NSA 29 05, number 11268.

HU-TFT-73-22 PC$3.00/MF$1.45
Helsinki Univ. (Finland). Research Inst. For Theoretical Physics.
CORRELATIONS BETWEEN NUCLEONS AND DELTA 'S.
A. M. Green, and P. Haapakoski. 1973, 13p
U.S. Sales Only.

Descriptors: (*Nuclei, *Exchange interactions), Correlations, N*resonances, Nucleons, Probability, Wave functions.

For abstract, see NSA 29 05, number 11561.

IKF-31 PC$9.00/MF$1.45
ANNUAL REPORT, 1972.
1972, 139p
In German. U.S. Sales Only.

Descriptors: (*Nuclear structure, *Research programs), (*Nuclear reactions, Research programs), (*Lattice vibrations, Research programs), (*Radiation protection, Research programs), Activation analysis, Atoms, Collisions, German federal republic, Mass spectroscopy, On-line computers, Performance, Radiation detectors, Spectrometers.

For abstract, see NSA 29 05, number 11483.

INP-823 PC$3.75/MF$1.45
Institute of Nuclear Physics, Krakow (Poland).
MICROSCOPIC MODEL OF THE ELASTIC SCATTERING OF MEDIUM ENERGY ALPHA PARTICLES.
A. Budzanowski, A. Dudek, K. Grotowski, Z. Majka, and A. Strzalkowski. Dec 72, 31p
U.S. Sales Only.

Descriptors: (*Intermediate mass nuclei, Alpha reactions), (*Heavy nuclei, Alpha reactions), (*Alpha reactions, *Elastic scattering), Angular distribution, Mev range 10-100, Nuclear potential, Optical models.

For abstract, see NSA 29 05, number 11562.

IS-T-617 PC$6.00/MF$1.45
Ames Lab., Iowa (Usa).
ONE PION PRODUCTION IN ANTI PP INTERACTIONS AT 2.85 GEV/C.
E. S. Hafen. Dec 73, 77p

Descriptors: (*Proton-antiproton interactions, *Total cross sections), (*Pions, *Particle production), (*Delta-1236 resonances, *Decay), Angular distribution, Antiprotons, C invariance, Cp invariance, Cross sections, Density matrix, Gev range 01-10, Isospin, Linear momentum, Matrix elements, Protons, Scattering amplitudes, Spin.

For abstract, see NSA 29 05, number 11216.

ITF-73-122-P PC$3.00/MF$1.45
An Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
ZERO-ENERGY KAON--DEUTERON ELASTIC SCATTERING.
V. I. Zasenko, V. V. Peresypkin, and N. M. Petrov. 1973, 10p
In Russian. U.S. Sales Only.

Descriptors: (*Kaon-deuteron interactions, *Elastic scattering), Faddeev equations, Kaon-nucleon interactions, Kaons plus, Potential scattering, S states, Scattering lengths, Two-body problem.

For abstract, see NSA 29 05, number 11289.

ITF-73-123-P PC$3.00/MF$1.45
An Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
VACUUM STATE IN DUAL MODELS.
D. V. Volkov, A. A. Zheltukhin, and A. I. Pashnev. 1973, 20p
In Russian. U.S. Sales Only.

Descriptors: (*Dual resonance model, *Vacuum states), Coupling constants, Duality, Elementary particles, Mass, Regge trajectories, Renormalization.

For abstract, see NSA 29 05, number 11277.

ITF-73-86-P PC$3.00/MF$1.45
An Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
PROCESSES GAMMA P IMPLIES PI DELTA AND THE CABIBBO--RADICATTI SUM RULES.
A. A. Zayats. 1973, 11p
In Russian. U.S. Sales Only.

Descriptors: (*Photon-proton interactions, *Sum rules), Gauge invariance, N*resonances, Ope model, Photoproduction, Pions, Scattering amplitudes.

For abstract, see NSA 29 05, number 11261.

ITF-73-87-P PC$3.50/MF$1.45
An Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
LEPTON FORMATION OF W-MESONS.
V. M. Pyzh. 1973, 28p
In Russian. U.S. Sales Only.

Descriptors: (*Leptons, *Weak interactions), (*Intermediate vector bosons, *Particle production), Boundary conditions, Differential cross sections, Magnetic moments, Scalars, Series expansion, Total cross sections, Vectors.

For abstract, see NSA 29 05, number 11269.

ITF-73-91-P PC$3.50/MF$1.45
An Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
MONOPOLE AND QUADRUPOLE VIBRATIONS OF MAGIC NUCLEI.
G. F. Filippov, and A. I. Steshenko. 1973, 27p
In Russian. U.S. Sales Only.

Descriptors: (*Oxygen 16, *Vibrational states), (*Calcium 40, Vibrational states), Nucleon-nucleon potential, Quadrupoles.

For abstract, see NSA 29 05, number 11384.

ITF-73-95-P PC$3.25/MF$1.45
An Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
INTEGRAL EQUATIONS FOR FOUR IDENTICAL PARTICLES WITH SEPARABLE TWO-PARTICLE INTERACTIONS.
V. F. Kharchenko, and V. E. Kuz'michev. 1973, 24p
In Russian. U.S. Sales Only.

Descriptors: (*Nucleons, *Four-body problem), Angular momentum, Bosons, Bound state, Equations of motion, Integral equations, Interactions, Two-body problem.

For abstract, see NSA 29 05, number 11288.

ITF-73-97-P PC$3.00/MF$1.45
An Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
FOUR-PARTICLE MODEL OF EXP 16 O AND ALPHA -- EXP 12 C SCATTERING.
V. F. Kharchenko, and V. E. Kuz'michev. 1973, 13p
In Russian. U.S. Sales Only.

Descriptors: (*Alpha reactions, *Scattering), (*Oxygen 16, *Cluster model), (*Carbon 12, Alpha reactions), Energy levels, Equations of motion, Excited states, Integral equations, Nuclear models, Nuclear potential, Parity, Scattering amplitudes.

For abstract, see NSA 29 05, number 11431.

JINR-E2-7257 PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Computing Techniques and Automation.
ASYMPTOTIC PROPERTIES OF CHARGE DISTRIBUTIONS.
S. Berceanu, T. Besliu, A. Gheorghe, and A. L. M. Mihul. 1973, 16p
U.S. Sales Only.

Descriptors: (*Pion-proton interactions, *Electric charges), (*Proton-proton interactions, Electric charges), Boundary conditions, Conservation laws, Distribution, Gev range 01-10, Gev range 10-100, Linear momentum, Sum rules, Tev range.

For abstract, see NSA 29 05, number 11283.

JINR-E2-7461 PC$4.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
LORENTZ-INVARIANT EXPANSION OF THE SCATTERING AMPLITUDE FOR PARTICLES OF ANY SPIN.
B. L. Aneva, S. Sh. Mavrodiev, and L. K. Hadjiivanov. 1973, 40p
U.S. Sales Only.

Descriptors: (*Pion-nucleon interactions, *Scattering amplitudes), (*Nucleon-nucleon interactions, Scattering amplitudes), Cpt theorem, Lorentz groups, P invariance, Spin, Spinors, T invariance.

For abstract, see NSA 29 05, number 11303.

JINR-E2-7508 PC$3.25/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
PION FORM FACTOR WITH GENERALIZED RHO DOMINANCE.
S. Dubnicka, and V. A. Meshcheryakov. 1973, 24p
U.S. Sales Only.

Descriptors: (*Pions, *Form factors), Dispersion relations, Isospin, Mass, Mathematical space, P waves, Particle radii, Particle widths, Phase shift, Rho-765 resonances, Vector dominance model.

For abstract, see NSA 29 05, number 11281.

JINR-E4-7535 PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
SOLUTION OF THREE-DIMENSIONAL LIPPMAN--SCHWINGER EQUATION WITHOUT PARTIAL-WAVE EXPANSION.
V. B. Belyaev, B. F. Irgaziev, and J. Wzecionko. 1973, 16p
U.S. Sales Only.

Descriptors: (*Potential scattering, *Lippmann-schwinger equation), Field theories, Gauss potential, Motion, Partial waves, Scattering amplitudes, Series expansion, Three-dimensional calculations.

For abstract, see NSA 29 05, number 11304.

JINR-E6-7419 PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Reactions.
SPIN ASSIGNMENT FOR SPONTANEOUSLY FISSIONING ISOMERS.
1973, 16p
U.S. Sales Only.

Descriptors: (*Plutonium 238, *Fission isomers), Angular distribution, Branching ratio, Nuclear potential, Spin, Spontaneous fission.

For abstract, see NSA 29 05, number 11535.

JINR-P1-7439 PC$3.50/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of High Energy.
CHARACTERISTICS OF EMISSION OF PI EXP 0 -, PI EXP + -MESONS AND PROTONS IN HIGH-ENERGY PI -MESON INTERACTIONS WITH XE NUCLEI.
B. Slovinskii, and Z. S. Strugal'skii. 1973, 28p
In Russian. U.S. Sales Only.

Descriptors: (*Xenon, *Pion reactions), Angular distribution, Distribution, Gev range 01-10, Linear momentum, Multiplicity, Pions neutral, Pions plus, Protons, Reaction kinetics.

For abstract, see NSA 29 05, number 11484.

JINR-P1-7475 PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of High Energy.
SEARCH FOR TETRANEUTRONS IN REACTIONS OF PI EXP - -MESON DOUBLE CHARGE EXCHANGE ON HEAVY NUCLEI.
Yu. A. Batusov, Zh. Ganzorig, L. Gumnerova, I. V. Dudova, and V. M. Sidorov. 1973, 12p
In Russian. U.S. Sales Only.

Descriptors: (*Lead, Pion reactions), (*Pion reactions, *Charge-exchange reactions), Bound state, Boundary conditions, Capture, Cross sections, Lead 208, Neutron reactions, Neutrons, Nuclei, Pions minus, Radiation detection, Tetraneutrons.

For abstract, see NSA 29 05, number 11516.

JINR-P15-7401 PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Neutron Physics.
STUDY OF THE EXP 22 NE(EXP 3 HE,P) EXP 24 NA, EXP 22 NE(EXP 3 HE, ALPHA) EXP 21 NE REACTION.
G. M. Osetinskii, 1973, 20p
In Russian. U.S. Sales Only.

Descriptors: (*Neon 22, Helium 3 reactions), (*Helium 3 reactions, *Compound-nucleus reactions), (*Magnesium 25, *Energy levels), Angular distribution, Excitation functions, Mev range 01-10, One-nucleon transfer reactions, Two-nucleon transfer reactions, Alpha particles, Sodium 21, Protons, Sodium 24, Compound nuclei, Level widths.

For abstract, see NSA 29 05, number 11420.

JINR-P2-7324 PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Problems.
CHARGE EXCHANGE OF FAST NUCLEONS ON DEUTERONS IN THE GLAUBER THEORY.
G. I. Lykasov, and A. V. Tarasov. 1973, 12p
In Russian. U.S. Sales Only.

Descriptors: (*Proton-deuteron interactions, *Charge-exchange interactions), Corrections, Differential cross sections, Glauber theory, Proton-neutron interactions, Scattering amplitudes, Spin.

For abstract, see NSA 29 05, number 11290.

JINR-P2-7436 PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of High Energy.
QUASI-FREE INTERACTIONS IN FAST PION COLLISIONS WITH ATOMIC NUCLEI.
B. S. Slovinskii. 1973, 12p
In Russian. U.S. Sales Only.

Descriptors: (*Xenon, *Pion reactions), Branching ratio, Charged particles, Gev range 01-10, Particle production, Statistics.

For abstract, see NSA 29 05, number 11485.

JINR-P2-7490 PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
SEMILEPTONIC AND NONLEPTONIC PROCESSES IN NONPOLYNOMIAL MODEL OF WEAK INTERACTIONS.
F. Kh. Abdullaev. 1973, 12p
In Russian. U.S. Sales Only.

Descriptors: (*Neutrino-nucleon interactions, *Elastic scattering), (*Kaons neutral long-lived, *Mass difference), (*Kaons neutral short-lived, Mass difference), (*Nucleons, *Mass), Corrections, Coupling, F-1260 resonances, Fermi interactions, Gravitation, Hadrons, Lagrangian field theory, Leptons, Nonlinear problems, Scattering amplitudes, Weak interactions.

For abstract, see NSA 29 05, number 11270.

JINR-P2-7507 PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Problems.
RECOIL AND CHARGE EXCHANGE EFFECTS IN PROTON ELASTIC SCATTERING BY EXP 3 HE AND EXP 4 HE NUCLEI.
G. I. Lykasov, and A. V. Tarasov. 1973, 20p
In Russian. U.S. Sales Only.

Descriptors: (*Helium 3, Proton reactions), (*Helium 4, Proton reactions), (*Proton reactions, *Elastic scattering), Charge exchange, Linear momentum transfer, Mev range 100-1000, Multiple scattering, Phase shift, Polarization, Protons, Recoils, Scattering amplitudes.

For abstract, see NSA 29 05, number 11364.

JINR-P2-7531 PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
REFLECTING AND THE TWISTING OPERATORS IN THE MODEL WITH THE FINITE SET OF OSCILLATORS.
Kh. D. Popov. 1973, 12p
In Russian. U.S. Sales Only.

Descriptors: (*Multiperipheral model, *Regge poles), Coherent scattering, Mathematical operators.

For abstract, see NSA 29 05, number 11245.

JINR-P3-7282 PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Neutron Physics.
WATER AND ZIRCONIUM HYDRIDE CONVERTERS FOR ULTRACOLD NEUTRONS (UCN). HOLDING OF NEUTRONS IN COPPER AND GLASS VESSELS.
L. V. Groshev, V. N. Dvoretskii, A. M. Demidov, V. I. Lushchikov, and S. A. Nikolaev. 1973, 20p
In Russian. U.S. Sales Only.

Descriptors: (*Cold neutrons, *Neutron sources), Water, Zirconium hydrides.

For abstract, see NSA 29 05, number 11346.

JINR-P4-7316 PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of High Energy.
NUCLEUS AS A QUANTUM ANALOG OF ELASTIC BODY.
G. N. Afanas'ev. 1973, 16p
In Russian. U.S. Sales Only.

Descriptors: (*Collective model, *Motion), (*Nuclei, *Elasticity), (*Nuclear structure, Elasticity), Quantum mechanics, Rotational states, Spherical model.

For abstract, see NSA 29 05, number 11563.

JINR-P4-7350 PC$3.75/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
FORM FACTORS FOR ELECTRON SCATTERING ON CARBON NUCLEI IN THE ALPHA-CLUSTER MODEL WITH PROJECTION.
E. V. Inopin, V. K. Luk'yanov, and Yu. S. Pol. 1973, 34p
In Russian. U.S. Sales Only.

Descriptors: (*Carbon 12, Electron reactions), (*Electron reactions, *Elastic scattering), Cluster model, Excited states, Form factors, Projection operators, Rotational states.

For abstract, see NSA 29 05, number 11385.

JINR-P4-7437 PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
GENERALIZATION OF THE PHASE FUNCTION METHOD IN THE POTENTIAL SCATTERING THEORY.
V. V. Babikov, and M. Kh. Khankhasaev. 1973, 12p
In Russian. U.S. Sales Only.

Descriptors: Differential equations, Integral equations, Nonlinear problems, Potential scattering, Scattering amplitudes.

For abstract, see NSA 29 05, number 11305.

JINR-P4-7479 PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
REACTION OF "COMPLETE DISINTEGRATION" OF NUCLEI.
V. D. Toneev, and S. E. Chigrinov. 1973, 20p
In Russian. U.S. Sales Only.

Descriptors: (*Evaporation model, *Spallation), (*Proton reactions, Spallation), (*Alpha reactions, Spallation), Decay, Nuclei.

For abstract, see NSA 29 05, number 11564.

JINR-P7-7409 PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Reactions.
EXPERIMENTS ON SUPERHEAVY NUCLEAR FUSION IN REACTIONS WITH GE IONS.
G. N. Flerov, Yu. Ts. Oganesyan, Yu. V. Lobanov, A. A. Pleve, and G. M. Ter-Akop'yan. 1973, 16p
In Russian. U.S. Sales Only.

Descriptors: (*Thorium 232, *Heavy ion reactions), (*Uranium 238, Heavy ion reactions), (*Germanium 74, Heavy ion reactions), (*Germanium 76, Heavy ion reactions), Boundary conditions, Cross sections, Fusion reactions, Nuclear reaction yield, Trans 104 elements.

For abstract, see NSA 29 05, number 11536.

KFK-1826 PC$9.75/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Neutronenphysik und Reaktortechnik.
SNOW: A TWO-DIMENSIONAL SN-PROGRAM FOR SOLVING THE NEUTRON-TRANSPORT-EQUATION IN RECTANGULAR AND CYLINDER GEOMETRY.
C. Guenther, and W. Kinnebrock. Jul 73, 153p
In German. U.S. Sales Only.

Descriptors: (*Computer codes, *S codes), (*Multigroup theory, Computer codes), (*Boltzmann equation, *Numerical solution), Anisotropy, Carlson method, Cylindrical configuration, Discrete ordinate method, Fortran, Ibm computers, Isotropy, Rectangular configuration, Scattering, Two-dimensional calculations.

For abstract, see NSA 29 05, number 11347.

KFKI-73-59 PC$3.00/MF$1.45
Kozponti Fizikai Kutato Intezet, Budapest (Hungary).
KINEMATICALLY COMPLETE MEASUREMENT ON THE D(N,NP) REACTION AT THETA/SUB N/ = 0 EXP 0 .
J. Kecskemeti, and T. Czibok. 1972, 13p
U.S. Sales Only.

Descriptors: (*Deuterium, Neutron reactions), (*Neutron reactions, *Breakup reactions), Differential cross sections, Energy spectra, Fast neutrons, Mev range 10-100, Neutrons, Protons.

For abstract, see NSA 29 05, number 11365.

LA-5400-MS PC$13.60/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
PUBLICATIONS OF LASL RESEARCH, 1967--1971.
A. K. Kerr. Sep 73, 782p
Contract W-7405-eng-36

Descriptors: (*Lasl, *Bibliographies).

For abstract, see NSA 29 05, number 12465.

LA-5424-MS PC$4.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
MU -CAPTURE AND THE N-N SCATTERING LENGTH.
B. F. Gibson, and G. J. Jr. Stephenson. Nov 73, 8p
Contract W-7405-eng-36

Descriptors: (*Neutron-neutron interactions, *Scattering lengths), (*Muon-deuteron interactions, *Capture), Coincidence methods, Energy spectra, Muons minus, Neutrinos, Neutrons, Particle production, Wave functions.

For abstract, see NSA 29 05, number 11291.

LBL-1991 PC$5.00/MF$1.45
Oxford Univ. (Uk). Nuclear Physics Lab.; California Univ., Berkeley (Usa). Lawrence Berkeley Lab.
MULTINUCLEON TRANSFER REACTIONS.
D. K. Scott. Aug 73, 56p CONF-730815-6
Contract W-7405-eng-48

Descriptors: (*Heavy ion reactions, Multi-nucleon transfer reactions), (*Multi-nucleon transfer reactions, *Reviews), Differential cross sections, Mev range 10-100, Mev range 100-1000, Nuclear reaction kinetics.

For abstract, see NSA 29 05, number 11386.

LBL-2115 PC$3.50/MF$1.45
California Univ., Berkeley (Usa). Lawrence Berkeley Lab.
SINGLE PARTICLE INCLUSIVE SPECTRA RESULTING FROM THE COLLISION OF RELATIVISTIC PROTONS, DEUTERONS, AND ALPHA PARTICLES WITH NUCLEI.
J. Jaros, J. Papp, L. Schroeder, J. Staples, and H. Steiner. Sep 73, 27p CONF-730943-10
Contract W-7405-eng-48

Descriptors: (*Beryllium, *Alpha reactions), (*Carbon, Alpha reactions), (*Copper, Alpha reactions), (*Lead, Alpha reactions), Alpha particles, Cross sections, Deuteron reactions, Deuterons, Energy spectra, Gev range 01-10, Helium 3, Inclusive interactions, Kaons plus, Limiting fragmentation, Lorentz invariance, Nuclear reaction yield, Particle models, Parton model, Pions minus, Pions plus, Proton reactions, Protons, Scale invariance, Tritons.

For abstract, see NSA 29 05, number 11217.

LBL-2320 PC$8.25/MF$1.45
California Univ., Berkeley (Usa). Lawrence Berkeley Lab.
TWO-NUCLEON TRANSFER REACTIONS INDUCED BY POLARIZED PROTONS.
J. A. Macdonald. Oct 73, 123p
Contract W-7405-eng-48

Descriptors: (*Carbon 13, *Proton reactions), (*Oxygen 16, Proton reactions), (*Nitrogen 15, Proton reactions), (*Beryllium 9, Proton reactions), Angular distribution, Differential cross sections, Energy-level transitions, Lithium 7, Mev range 10-100, Pickup reactions, Polarization-asymmetry ratio, Two-nucleon transfer reactions.

For abstract, see NSA 29 05, number 11387.

LNF-73-5 PC$3.00/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Frascati (Italy). Laboratori Nazionali di Frascati.
CALCULATION OF THE (GAMMA ,N) CROSS SECTION OF NUCLEI AT INTERMEDIATE ENERGY.
G. A. Rottigni. 14 Feb 73, 14p
In Italian. U.S. Sales Only.

Descriptors: Cross sections, Mev range, Nuclei, Nucleons, Photonuclear reactions.

For abstract, see NSA 29 05, number 11565.

LYCEN-7305 PC$7.00/MF$1.45
SPECTROSCOPIC STUDY OF THE ISOTOPES EXP 202 HG, EXP 200 HG, EXP 198 HG, AND EXP 196 HG.
R. Beraud. 1973, 98p
In French. U.S. Sales Only.

Descriptors: (*Mercury 196, *Energy levels), (*Mercury 200, Energy levels), (*Mercury 202, Energy levels), Branching ratio, Energy-level transitions, Mixing ratio, Multipolarity, Nuclear structure, Particle-hole model, Quadrupole moments, Spin, Lifetime, Mercury 198, Angular correlation, Beta-plus decay, Electron capture decay, Ft value, Gamma spectra, Thallium 196, Thallium 198, Internal conversion, Thallium 200, Thallium 202.

For abstract, see NSA 29 05, number 11517.

LYCEN-7319 PC$6.50/MF$1.45
SU SUB 4 INVARIANTS AND NUCLEAR BINDING ENERGY.
C. Maguin. 1973, 89p
In French. U.S. Sales Only.

Descriptors: (*Nuclei, *Binding energy), (*Nuclear models, *Supermultiplets), Coulomb correction, Mass formulae, Mathematical operators, Nuclear forces, Su-4 groups.

For abstract, see NSA 29 05, number 11566.

NP-19798 PC$3.00/MF$1.45
Tampere Univ. Of Tech. (Finland).
DECAY OF EXP 233 PA TO THE LEVELS IN EXP 233 U. RESEARCH REPORT NO. 9, 1972.
T. Valkeapaeae, A. Siivola, and G. Graeffe. Dec 72, 18p
U.S. Sales Only.

Descriptors: (*Protactinium 233, *Beta-minus decay), (*Uranium 233, *Energy levels), Coincidence methods, Energy-level transitions, Gamma spectra, Multipolarity, Parity, Probability, Spin.

For abstract, see NSA 29 05, number 11537.

NP-19873 PC$11.50/MF$1.45
Tokyo Univ., Tanashi (Japan). Inst. For Nuclear Study.
ANNUAL REPORT, APRIL 1972--MARCH 1973.
1973, 187p
U.S. Sales Only.

Descriptors: (*Cyclotrons, *Accelerator facilities), (*Synchrotrons, Accelerator facilities), (*Nuclear physics, *Research programs), (*High energy physics, Research programs), Cosmic radiation, Data acquisition systems, Electrons, Japan, Leading abstract, Operation.

For abstract, see NSA 29 05, number 11486.

NP-19891 PC$3.50/MF$1.45
Jyvaeskylae Univ. (Finland). Dept. Of Physics.
DISTRIBUTIONS IN A TWO-COMPONENT MODEL. RESEARCH REPORT NO. 14/1973.
E. H. de Groot, K. Kajantie, and P. V. Ruuskanen. Jul 73, 27p
U.S. Sales Only.

Descriptors: (*Proton-proton interactions, *Inclusive interactions), (*Diffraction models, Proton-proton interactions), Distribution, Multiplicity, Pions, Protons.

For abstract, see NSA 29 05, number 11292.

NP-19892 PC$3.50/MF$1.45
Jyvaeskylae Univ. (Finland). Dept. Of Physics.
6.1 S ISOMER AND ROTATIONAL BANDS IN EXP 192 OS. RESEARCH REPORT NO. 13/1973.
A. Pakkanen, and D. W. Heikkinen. Jul 73, 26p
U.S. Sales Only.

Descriptors: (*Osmium 192, *Energy levels), Branching ratio, Energy-level transitions, Gamma spectra, Lifetime, Parity, Probability, Rotational states, Spin.

For abstract, see NSA 29 05, number 11523.

ORNL-TM-4389 PC$8.50/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
GAMMA-RAY PRODUCTION FROM NEUTRON INTERACTIONS WITH SILICON FOR INCIDENT NEUTRON ENERGIES BETWEEN 1.0 AND 20 MEV: TABULATED DIFFERENTIAL CROSS SECTIONS.
J. K. Dickens, T. A. Love, and G. L. Morgan. Dec 73, 130p
Contract W-7405-eng-26

Descriptors: (*Silicon, *Neutron reactions), Cross sections, Data, Fast neutrons, Gamma radiation, Gamma spectra, Mev range 01-10, Mev range 10-100, Tables.

For abstract, see NSA 29 05, number 11421.

ORO-1316-168 PC$3.25/MF$1.45
Rice Univ., Houston, Tex. (Usa). Bonner Nuclear Labs.
NUCLEAR PHYSICS PROGRESS REPORT, APRIL 1, 1973--MARCH 31, 1974.
G. C. Phillips. 1974, 23p
Contract AT(40-1)-1316

Descriptors: (*Nuclear physics, *Research programs), Light nuclei, Nuclear reactions, Nuclear theory, Texas.

For abstract, see NSA 29 05, number 11390.

ORO-1316-169 PC$3.00/MF$1.45
Rice Univ., Houston, Tex. (Usa). Bonner Nuclear Labs.
NUCLEAR STRUCTURE AT INTERMEDIATE ENERGIES PROGRESS REPORT, APRIL 1, 1973--MARCH 31, 1974.
G. C. Phillips. 1974, 17p
Contract AT(40-1)-1316

Descriptors: (*Nuclear structure, *Research programs), Breakup reactions, Nuclear theory, Pion reactions, Proton reactions, Texas.

For abstract, see NSA 29 05, number 11391.

ORO-4317-32 PC$3.00/MF$1.45
Maryland Univ., College Park (Usa). Dept. Of Physics and Astronomy.
WHAT CAN WE LEARN FROM THREE-BODY REACTIONS. TECHNICAL REPORT NO. 74-037.
D. D. Brayshaw. Nov 73, 12p

Descriptors: (*Neutron reactions, *Breakup reactions), (*Deuterium, Neutron reactions), Elastic scattering, Nucleon-nucleon potential, Scattering lengths, Three-body problem.

For abstract, see NSA 29 05, number 11367.

RCN-196 PC$10.25/MF$1.45
Stichting Reactor Centrum Nederland, Petten.
COMPILATION OF EVALUATED CROSS SECTION DATA USED IN FAST NEUTRON METROLOGY.
W. L. Zijp, W. P. Voorbraak, and H. J. Nolthenius. Oct 73, 165p
U.S. Sales Only.

Descriptors: (*Neutron reactions, *Cross sections), Comparative evaluations, Data, Fast neutrons, Fission spectra, Mev range 01-10, Mev range 10-100, Radioactivation, Tables, Threshold energy.

For abstract, see NSA 29 05, number 11348.

RLO-2041-93 PC$4.75/MF$1.45
Tufts Univ., Medford, Mass. (Usa). Dept. Of Physics; Oregon Univ., Eugene (Usa). Inst. Of Theoretical Science.
SPIN CORRELATION MEASUREMENTS IN PSEUDOSCALAR MESON PHOTOPRODUCTION.
G. R. Goldstein, J. F. III Owens, J. P. Rutherfoord, and M. J. Moravcsik. 1973, 53p

Descriptors: (*Pseudoscalar mesons, *Photoproduction), (*Photon-nucleon interactions, *Spin), Boundary conditions, Correlations, Cross sections, Helicity, P invariance, Pions neutral, Polarization, Protons, Scattering amplitudes.

For abstract, see NSA 29 05, number 11203.

RLO-2041-94 PC$4.50/MF$1.45
California Univ., Davis (Usa). Dept. Of Physics; Oregon Univ., Eugene (Usa).
NON-DYNAMICAL STRUCTURE OF REACTIONS INVOLVING FOUR SPIN-1/2 PARTICLES.
R. V. Jr. Reid, and M. J. Moravcsik. 1972, 46p

Descriptors: (*Fermi interactions, *Spin), Conservation laws.

For abstract, see NSA 29 05, number 11271.

RT/FI-(73)16 PC$6.50/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Bologna (Italy). Centro di Calcolo.
FOUR ACES: A PROGRAMME FOR PRODUCING GROUP AVERAGED CROSS SECTIONS FROM DIFFERENT FILES.
G. C. Panini. 28 May 73, 89p
U.S. Sales Only.

Descriptors: (*Computer codes, *F codes), Breitwigner formula, Cross sections, Doppler broadening, Fortran, Ibm computers, Multigroup theory, Multilevel analysis, Neutron reactions, Reichmoore formula, Resonance.

For abstract, see NSA 29 05, number 11349.

TID-26495 PC$3.00/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
EVIDENCE FOR TWO- DELTA (1236) COMPONENT OF DEUTERON GROUND STATE.
M. Goldhaber. 1973, 4p

Descriptors: (*Deuterons, *Energy levels), Delta-1236 resonances.

For abstract, see NSA 29 05, number 11284.

TID-26497 PC$4.50/MF$1.45
Florida State Univ., Tallahassee (Usa).
RESONANCE STRUCTURE IN K EXP - N IMPLIES Y PI REACTIONS IN THE CENTER OF MASS ENERGY RANGE 1550 TO 1650 MEV.
W. A. Morris. Jun 73, 46p

Descriptors: (*Kaon-neutron interactions, *Cross sections), (*Y*resonances, *Particle properties), (*Sigma-1620 resonances, Particle properties), Baryon resonances, Energy dependence, Kaons minus, Lambda particles, Parity, Partial waves, Particle production, Pions minus, Pions neutral, Sigma minus, Spin.

For abstract, see NSA 29 05, number 11237.

TID-26499 PC$8.00/MF$1.45
Florida State Univ., Tallahassee (Usa).
K EXP - D AND K EXP - NP REACTIONS AT 727 MEV/C.
R. P. Wieckowicz. Jun 73, 120p

Descriptors: (*Kaon-deuteron interactions, *Differential cross sections), (*Kaon-neutron interactions, Differential cross sections), Elastic scattering, Glauber theory, Kaons minus, Mev range 100-1000, Partial waves.

For abstract, see NSA 29 05, number 11238.

TKK-F-A-216 PC$3.00/MF$1.45
Helsinki Univ. Of Technology, Otaniemi (Finland). Dept. Of Technical Physics.
OPTIMAL ANGULAR QUADRATURE SETS IN THE DISCRETE S/SUB N/ APPROXIMATION TO NEUTRON TRANSPORT THEORY.
H. Kalli. 23 Oct 73, 15p
U.S. Sales Only.

Descriptors: (*Slabs, *Neutron transport), Neutron transport theory, One-dimensional calculations, Optimization, Quadratures.

For abstract, see NSA 29 05, number 11350.

UCID-15937(Rev.1) PC$3.50/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
STATUS REPORT TO NCSAC.
C. D. Bowman. 10 Nov 71, 26p

Descriptors: (*Neutron reactions, *Fission), (*Nuclear physics, *Data), Cross sections, Photonuclear reactions.

For abstract, see NSA 29 05, number 11538.

UCID-16395 PC$3.25/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
STATUS REPORT TO USNDC.
J. D. Anderson, and J. C. Browne. 14 Nov 73, 23p
Contract W-7405-eng-48

Descriptors: (*Lawrence livermore laboratory, *Nuclear physics), Data, Neutron reactions, Standards, Thermonuclear reactions.

For abstract, see NSA 29 05, number 11351.

UCID-16397 PC$3.50/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
COMPARISON OF EXPERIMENTAL DATA FROM ENERGY-DEPENDENT RESONANCE SELF-SHIELDING FACTORS FOR EXP 235 U AND EXP 239 PU WITH CALCULATIONS FROM TART.
L. J. Bacon. 29 Nov 73, 26p
Contract W-7405-eng-48

Descriptors: (*Computer codes, *T codes), (*Uranium 235, Neutron reactions), (*Plutonium 239, Neutron reactions), (*Neutron reactions, *Fission), Accuracy, Cross sections, Energy dependence, Ev range, Kev range 01-10, Neutron transport, Resonance, Self-shielding, Thickness.

For abstract, see NSA 29 05, number 11354.

UCRL-51458 PC$5.45/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
COMPILATION OF FISSION PRODUCT YIELDS IN USE AT THE LAWRENCE LIVERMORE LABORATORY.
D. R. Nethaway, and G. W. Barton. 3 Oct 73, 106p
Contract W-7405-Eng-48

Descriptors: (*Thorium 232, *Neutron reactions), (*Uranium 233, Neutron reactions), (*Uranium 235, Neutron reactions), (*Uranium 238, Neutron reactions), Fast neutrons, Fission, Fission neutrons, Fission products, Fission yield, Lawrence livermore laboratory, Mev range 10-100, Plutonium 239, Tables, Thermal neutrons.

For abstract, see NSA 29 05, number 11541.

UCRL-51478 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
DETERMINATION OF ABSOLUTE FISSION CROSS SECTION RATIOS USING THE METHOD OF THRESHOLD CROSS SECTIONS.
J. W. Behrens. 12 Nov 73, 4p
Contract W-7405-Eng-48

Descriptors: (*Neutron reactions, *Fast fission), Cross sections, Fast neutrons, Measuring methods, Mev range.

For abstract, see NSA 29 05, number 11542.

USIP-73-8 PC$3.25/MF$1.45
Stockholm Univ. (Sweden). Fysiska Institutionen.
GAMMA--GAMMA DIRECTIONAL CORRELATIONS IN EXP 103 RH.
C. Bargholtz, J. Becker, L. Eriksson, L. Gidefeldt, and L. Holmberg. Apr 73, 21p
U.S. Sales Only.

Descriptors: (*Ruthenium 103, *Beta-minus decay), (*Rhodium 103, *Energy-level transitions), Angular correlation, Gamma radiation, Gamma spectra, Coupling, Energy levels, Excitation, Gyromagnetic ratio, Kev range 10-100, Lifetime, Magnetic dipole moments, Mixing ratio, Multipolarity, Probability, Spin, Unified model.

For abstract, see NSA 29 05, number 11493.

20I. Plasma Physics

AD-774 948/4GA PC$3.75/MF$1.45
Missouri Univ Rolla Dept of Physics
ATOMIC BEAM PLASMA DIAGNOSTICS.
Technical rept. no. 1 (Annual), 1 Nov 72-31 Oct 73,
Kaare J. Nygaard. 31 Dec 73, 70p
Contract N00014-69-A-0141-0007

Descriptors: *Plasmas(Physics), *Atomic beams, *Electron density, *Electron energy, Diagnosis(General), Ion beams, Solid state lasers, Line spectra, Nuclear fusion, Magnetohydrodynamics.
Identifiers: *Plasma diagnostics, Gallium arsenide lasers.

The report is concerned with the application of atomic and ionic beams for measurement of electron density and temperature of fusion plasma. The average electron density is determined from the attenuation of an atomic beam. Spectroscopic line ratio measurements along the beam provide information about the electron temperature distribution. Single shot measurements can be made and the data handling automated with an Optical Multichannel Analyzer. The electron density distribution can best be measured with an ion beam. The plasma potential can be determined exactly from the energy difference between secondary and primary ions. Four appendices include completed research on photo- and electron-impact ionization as well as properties of GaAs lasers. (Author)

AD-775 051/6GA PC$6.75/MF$1.45
Rensselaer Polytechnic Inst Troy N Y Plasma Dynamics Lab
AN ION BEAM PROBE DIAGNOSTIC TECHNIQUE FOR LABORATORY PLASMAS.
Interim rept.,
Robert E. Reinovsky. Aug 73, 293p Rept no. RPDL-73-13 AFOSR-TR-74-0242
Grant AF-AFOSR-2191-72

Descriptors: *Plasmas(Physics), *Ion beams, Probes, Magnetic pinch, Electron density, Electron energy, Space charge, Theses.
Identifiers: *Plasmas diagnostics.

Ion beam probing has been shown to be a general purpose diagnostic tool for magnetically confined plasmas. A complete system was designed, constructed, and operated on a number of laboratory plasmas to demonstrate the applicability of beam proving to laboratory devices. The results demonstrate that the advantages of ion beam probing can be achieved with modest expenditure of time and resources. The various components of a complete beam probe system have been investigated theoretically and experimentally for the first time. The results show that the beam probe system is dominated by electron impact ionization, as expected, that simple detectors have several limitations, and that the feedback controlled electrostatic energy analyzer demonstrates the spatial and time resolution expected from the theoretical analysis. (Modified author abstract)

AD-775 087/8GA PC$4.50/MF$1.45
Visidyne Inc Burlington Mass
RESEARCH CONCERNING X-RAY EMISSION OF MAGNETOACTIVE PLASMAS.
Final rept.,
Oscar P. Manley. 3 Jan 74, 27p Rept no. VI-221 AFOSR-TR-74-0182
Contract F44620-70-C-0093

Descriptors: *Plasmas(Physics), *X rays, Thermodynamics, Emission, Magnetohydrodynamics, Stability.

The applicability of two distinct approaches to the problem of structural stability of optically thin hot radiating plasma was investigated. It was found that by exploring the properties of the simple isotropic model that: (1) topological methods lead to simple diagrams from which stability may be easily determined; (2). these methods also yield approximations useful in estimating the solutions applicable beyond the point of instability; and, (3). some concepts of non-equilibrium steady state thermodynamics have been found applicable in studying the behavior of radiating plasmas. In particular, while the simple criterion of minimum free energy is inadequate for determining system stability under small perturbations, an extended definition of entropy production was found to be equivalent to a Liapounoff function for the system. (Modified author abstract)

AD-775 099/5GA PC$5.50/MF$1.45
Avco Everett Research Lab Inc Everett Mass
INVESTIGATION OF THE PRODUCTION OF HIGH DENSITY UNIFORM PLASMAS,
R. Patrick, and D. Douglas-Hamilton. Jan 74, 46p AFOSR-TR-74-0194
Contract F44620-70-C-0023

Descriptors: *Plasmas(Physics), *Electric discharges, Gas lasers, Electron beams, Electron energy, Instability, Electron density.

A stable high-pressure electric discharge is produced using an electron beam to ionize the gas. The attachment instability in the discharge, discovered under this program, has been investigated in the gas mixtures (He:CO2:H2O) = (74:0:2), (9:1:0), (1:1:0) (mole fraction) and a theory predicting the instability has been derived. Experimental measurements of the discharge parameters for instability onset agree well with theoretical predictions. It appears that the onset of discharge arcing may be associated with this phenomenon, and theoretical understanding of it is expected to be of considerable importance in electric discharge gas laser systems. (Author)

AD-775 138/1GA PC$4.25/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
PASSAGE OF CURRENT THROUGH BOUNDARY LAYERS,
V. Yu. Baranov, D. D. Malyuta, and F. R. Ulinich. 1 Feb 74, 23p Rept no. FTD-HT-23-698-74
Edited trans. of Teplofizika Vysokikh Temperatur (USSR) v11 n3 p457-467 May/Jun 73, by Louise E. Heenan.

Descriptors: *Magnetohydrodynamic generators, *Electric current, *Boundary layer, Electrodes, Plasmas(Physics), Combustion products, Translations, USSR.

The drop in potential near an electrode in the presence of a cold boundary layer is studied theoretically and experimentally. The effect of a microarc on the gas-dynamic parameters in the channel of a MHD generator is analyzed.

AD-775 274/4GA Reprint
Princeton Univ N J Plasma Physics Lab
RUNAWAY ELECTRONS IN A PLASMA,
Russell M. Kulsrud, Yung-Chiun Sun, Niels K. Winsor, and Henry A. Fallon. 20 Jun 73, 5p Rept no. PPL-AP-68 AFOSR-TR-74-0209
Contracts F44620-70-C-0033, AT(11-1)-3073
Sponsored in part by Grant NSF-GP-579.
Availability: Pub. in Physical Review Letters, v31 n11 p690-693, 10 Sep 73.

Descriptors: *Plasmas(Physics), *Electron energy, Electric fields, Electron density.
Identifiers: Fokker-Planck equation.

The electron runaway rate in a uniform plasma under a uniform electric field is calculated by solving the Fokker-Planck equation numerically. Comparison with other theoretical and experimental results is made. (Author)

AD-775 293/4GA Reprint
California Univ Los Angeles Dept of Physics
GROWTH AND SATURATION OF THE ABSOLUTE ELECTRON-CYCLOTRON DRIFT INSTABILITY,
Reiner L. Stenzel, and Barrett H. Ripin. 23 Jul 73, 6p AFOSR-TR-74-0208
Grant AF-AFOSR-2332-72
Availability: Pub. in Physical Review Letters, v31 n26 p1545-1548, 24 Dec 73.

Descriptors: *Plasmas(Physics), *Electron energy, Ions, Instability.

The electron-cyclotron drift instability is observed to develop an absolute instability in the laboratory frame of stationary electrons. The authors investigate the threshold, temporal and spatial growth, and the saturation mechanism. (Author)

AD-775 322/1GA PC$5.25/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
INTERACTIONS OF FAST PARTICLES WITH THE WAVES OF MAGNETO-ACTIVE PLASMA,
V. N. Tsytovich. 14 Jan 74, 44p Rept no. FTD-HT-23-203-74
Edited trans. of Akademiya Nauk SSSR. Fizicheskii Institut. Preprint, n54 p1-50 1973, by Paul J. Reiff.

Descriptors: *Plasmas(Physics), *Interstellar matter, Turbulence, Magnetic fields, Solar wind, Translations, USSR.

AD-775 448/4GA PC$5.25/MF$1.45
Harry Diamond Labs Washington D C
SIMULATION OF A SIMPLE LORENTZ PLASMA WITH A RANDOM DISTRIBUTION OF INDUCTIVELY LOADED DIPOLES,
George Merkel. Nov 73, 45p Rept no. HDL-TR-1637

Descriptors: *Plasmas(Physics), *Electromagnetic pulses, *Nuclear explosions, Dielectric properties, Dipole moments, Simulation, Electromagnetic scattering.
Identifiers: Lorentz plasmas.

The feasibility of simulating a simple Lorentz plasma with an artificial dielectric constructed from a random distribution of inductively loaded dipoles is investigated. Both the differences and similarities between the macroscopic electromagnetic properties of the artificial dielectric and Lorentz plasma are discussed. (Author)

AD-775 548/1GA PC$4.00/MF$1.45
Maryland Univ College Park Dept of Physics and Astronomy
PRODUCTION OF THERMONUCLEAR PLASMAS BY ANOMALOUS DIFFUSION OF MAGNETIC FIELDS IN A HIGH VOLTAGE THETA PINCH.
Annual summary rept.
Nov 73, 83p
Contract N00014-67-A-0239-0015
See also AD-757 043.

Descriptors: *Plasmas(Physics), *Magnetic pinch, *Nuclear fusion, Heating, X rays, Electron energy, Electron density, Ions.

The report summarizes work done at the University of Maryland in the problem of plasma heating by application of a large amplitude magnetic pulse at the plasma boundary. The authors have been particularly interested in the ion heating resulting from drift instabilities and its scaling with initial

plasma conditions. In the reporting period work was concentrated on measurements of x-ray intensities as an indication of electron temperature, and on electron heat loss processes. Attempts were made to directly measure ion energy spectra, and to measure electron densities.

AD-775 581/2GA PC$3.00/MF$1.45
Wisconsin Univ Madison Mathematics Research Center
ON THE STRUCTURE OF MAGNETOHYDRODYNAMIC SHOCK WAVES.
Technical summary rept.,
Joel A. Smoller, and Charles C. Conley. Feb 74, 19p Rept no. MRC-TSR-1336
Contract DA-31-124-ARO(D)-462, Grant AF-AFOSR-2122-71
Sponsored in part by Grant NSF-GP-28267.

Descriptors: *Magnetohydrodynamics, *Shock waves, Thermodynamics, Algebraic topology, Theorems.
Identifiers: Homotopy theory.

Fast and slow magnetohydrodynamic shock waves of arbitrary strength, for general equations of state and for arbitrary non-zero viscosity matrix, are shown to possess structure. (Author)

CEA-CONF-2313 PC$3.25/MF$1.45
APPLICATION OF MICROWAVES AND FAR INFRARED TO THE PROBLEMS OF DIAGNOSTICS IN RESEARCH ON CONTROLLED FUSION.
C. Etievant. 1973, 21p CONF-730551-2
In French. U.S. Sales Only.

Descriptors: (*Plasma diagnostics, Far infrared radiation), (*Microwave radiation, Plasma diagnostics), (*Far infrared radiation, Plasma diagnostics), Faraday effect, Interferometry, Magnetic fields, Nonlinear problems, Plasma density, Scattering.

For abstract, see NSA 29 05, number 11605.

CEA-CONF-2314 PC$3.00/MF$1.45
MEASUREMENT OF THE PROFILE OF ELECTRON DENSITY IN AN INHOMOGENEOUS PLASMA.
J. P. Crenn. 15p CONF-730551-1
In French. U.S. Sales Only.

Descriptors: (*Plasma diagnostics, *Interferometers), (*Microwave radiation, Plasma diagnostics), Electron density, Inhomogeneous plasma.

For abstract, see NSA 29 05, number 11606.

CEA-CONF-2381 PC$3.00/MF$1.45
Brussels Univ. (Belgium); Cea Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France).
SUPERKINETIC EQUATION FOR NON-UNIFORM SYSTEMS IN A TIME-DEPENDENT EXTERNAL FIELD. EXACT EQUATION FOR STRONG COLLISIONAL PLASMA TURBULENCE.
R. Balescu, and J. H. Misguich. 4p CONF-730906-6
U.S. Sales Only.

Descriptors: (*Collisional plasma, *Kinetic equations), Distribution functions, Electromagnetic fields, Time dependence, Turbulence.

For abstract, see NSA 29 05, number 11626.

CEA-CONF-2410 PC$3.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Grenoble, 38 (France). Dept. De la Physique du Plasma et de la Fusion Controlee.
THE RF-HEATING APPROACH TO THE IGNITION PROBLEM IN LOW- BETA TORI.
E. Canobbio. 1973, 12p CONF-730705-17
U.S. Sales Only.

Descriptors: (*Tokamak devices, *High-frequency heating), (*Plasma heating, High-frequency heating), (*Stellarators, High-frequency heating), Low-beta plasma, Scaling laws, Thermonuclear reactions, Toroidal configuration.

For abstract, see NSA 29 05, number 11597.

CEA-R-4489 PC$6.25/MF$1.45
Cea Centre d'Etudes de Limeil, 94 - Villeneuve-Saint-Georges (France).
MEASUREMENT OF THE ION TEMPERATURE OF THE PLASMA FOCUS USING RUBY SCATTERING.
A. Jolas. Dec 73, 84p
U.S. Sales Only.

Descriptors: (*Plasma focus devices, Plasma diagnostics), (*Plasma diagnostics, Laser radiation), (*Laser radiation, *Scattering), Distribution, Electron density, Ion temperature, Ruby, Velocity.

For abstract, see NSA 29 05, number 11607.

COO-2277-2 PC$5.25/MF$1.45
United Aircraft Corp., East Hartford, Conn. (Usa). Research Labs.
HIGH- BETA CAPTURE AND MIRROR CONFINEMENT OF LASER-PRODUCED PLASMAS. SEMIANNUAL REPORT, FEBRUARY 1--JULY 31, 1973.
A. F. Haught, D. H. Polk, J. T. Woo, W. J. Fader, and R. G. Tomlinson. 31 Jul 73, 62p UARL-M-921514-19
Contract AT(11-1)-2277

Descriptors: (*Laser-produced plasma, *Fuel pellets), (*Magnetic mirror configurations, Laser-produced plasma), (*Plasma heating, *Laser-radiation heating), Confinement, Fokker-planck equation, High-beta plasma, Neutral atom beam injection.

For abstract, see NSA 29 05, number 11598.

FUPH-R-91 PC$3.75/MF$1.45
Flinders Univ. Of South Australia, Bedford Park. School of Physical Sciences.
PROPAGATION OF COMPRESSIONAL ALFVEN WAVES IN NONUNIFORM PLASMAS.
R. Morrow, and M. H. Brennan. Aug 73, 35p
U.S. Sales Only.

Descriptors: (*Alfven waves, *Wave propagation), (*Plasma waves, Alfven waves), Boundary conditions, Collisions, Cross sections, Cyclotron frequency, Dispersion relations, Electric conductivity, Hydrogen, Ion density, Ions, Neutral particles, Plasma.

For abstract, see NSA 29 05, number 11664.

IAE-2232 PC$3.00/MF$1.45
Gosudarstvennyj Komitet Po Ispol'Zovaniyu Atomnoj Ehnergii Sssr, Moscow. Inst. Atomnoj Ehnergii.
COLLISIONAL ELECTRON BROADENING OF STARK SUBLEVELS OF AN ATOM OF HYDROGEN IN A PLASMA.
G. V. Sholin, A. V. Demura, and V. S. Lisitsa. 1972, 20p
In Russian. U.S. Sales Only.

Descriptors: (*Collisional plasma, *Spectra), (*Hydrogen, Spectra), Collisions, Electrons, Ions, Line broadening, Stark effect.

For abstract, see NSA 29 05, number 11627.

IAE-2254 PC$3.00/MF$1.45
Gosudarstvennyj Komitet Po Ispol'Zovaniyu Atomnoj Ehnergii Sssr, Moscow. Inst. Atomnoj Ehnergii.
TURBULENT HEATING OF PLASMA BY A CURRENT IN A "TOKAMAK".
R. I. Azizov, A. A. Ivanov, O. A. Zinov'ev, G. I. Kalinnikov, and S. L. Nedoseev. 1973, 20p
In Russian. U.S. Sales Only.

Descriptors: (*Plasma heating, *Turbulent heating), (*Tokamak devices, Turbulent heating), Electric currents, Thermonuclear reactor walls.

For abstract, see NSA 29 05, number 11599.

IPP-III-10 PC$5.00/MF$1.45
Max-Planck-Institut fuer Plasmaphysik, Garching/Munich (F.R. Germany).
DIFFRACTION IMAGE OF A FINITE SIZE OBJECT IN AN ANNULAR APERTURE SYSTEM.
S. Sesnic, J. Fujita, and F. Pohl. Jul 73, 57p
U.S. Sales Only.

Descriptors: (*Plasma diagnostics, Laser radiation), (*Laser radiation, *Diffraction), Apertures, Images, Plasma, Scattering.

For abstract, see NSA 29 05, number 11608.

IPP-IV-58 PC$3.25/MF$1.45
Max-Planck-Institut fuer Plasmaphysik, Garching/Munich (F.R. Germany).
CALCULATION OF FREE--FREE RADIATION FROM PLASMAS WITH NON-MAXWELLIAN ISOTROPIC OR ANISOTROPIC ELECTRON VELOCITY DISTRIBUTION.
K. Eidmann. Jul 73, 23p
U.S. Sales Only.

Descriptors: (*Plasma, *Bremsstrahlung), Anisotropy, Collisions, Distribution functions, Electrons, Ions, Laser-produced plasma, Velocity.

For abstract, see NSA 29 05, number 11628.

JINR-P11-7299 PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Computing Techniques and Automation.
COMPUTER SIMULATION PROGRAM OF FLAT CHARGED LAYER BEHAVIOR IN AN EXTERNAL FIELD BY THE FINITE-SIZE PARTICLE METHOD AND USING THE DISPLAY FOR RESULT REPRESENTATION.
A. M. Gazetova, E. P. Zhidkov, A. A. Karlov, Yu. V. Katyshev, and G. A. Ososkov. 1973, 20p
In Russian. U.S. Sales Only.

Descriptors: Charged particles, Computer calculations, Computer codes, Display devices, Electromagnetic fields, Layers, Plasma simulation.

For abstract, see NSA 29 05, number 11630.

LA-5448-MS PC$4.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
NOTE ON THE CALCULATION OF ENERGY DEPOSITION OF ALPHA PARTICLES IN A DT PLASMA BY RUTHERFORD SCATTERING.
F. Evans. Nov 73, 11p
Contract W-7405-eng-36

Descriptors: (*Plasma, Alpha particles), (*Alpha particles, *Energy losses), Analytical solution, Deuterium, Rutherford scattering, Tritium.

For abstract, see NSA 29 05, number 11631.

LRP-62-73 PC$7.00/MF$1.45
Centre de Recherches en Physique des Plasmas, Lausanne (Switzerland).
PROPAGATION OF HYDROMAGNETIC WAVES OF AZIMUTHAL WAVE NUMBER M NOT EQUAL 0 IN A CYLINDRICAL ARGON PLASMA.
J. M. Peiry. Mar 73, 99p
In French. U.S. Sales Only.

Descriptors: (*Hydromagnetic waves, *Wave propagation), (*Plasma waves, Hydromagnetic waves), Argon, Boundary conditions, Cylindrical configuration, Electron density, Interferometry, Magnetic fields.

For abstract, see NSA 29 05, number 11665.

LRP-67-73 PC$3.00/MF$1.45
Centre de Recherches en Physique des Plasmas, Lausanne (Switzerland).
KORTEWEG--DE VRIES EQUATION FOR A TWO COMPONENT PLASMA.
M. Q. Tran, and P. J. Hirt. Sep 73, 11p
U.S. Sales Only.

Descriptors: (*Cold plasma, *Korteweg-de vries equation), Ion temperature, Ions, Plasma waves.

For abstract, see NSA 29 05, number 11632.

ORNL-TM-4421 PC$7.25/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
ASSESSMENT OF THE POWER BALANCE IN FUSION REACTORS.
M. Nozawa, and D. Steiner. Jan 74, 105p
Contract W-7405-eng-26

Descriptors: (*Laser-produced plasma, *Energy balance), (*Magnetic mirrors, Energy balance), (*Theta pinch, Energy balance), (*Tokamak devices, Energy balance), Analytical solution, Deuterium, Lasers, Tritium.

For abstract, see NSA 29 05, number 11633.

ORNL-TM-4432 PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
RUNAWAY ELECTRON DYNAMICS.
D. Spong, and J. F. Clarke. Dec 73, 17p
Contract W-7405-eng-26

Descriptors: (*Tokamak devices, *Runaway electrons), (*Ormak devices, Runaway electrons), Analytical solution, Electron drift, Self-consistent field.

For abstract, see NSA 29 05, number 11601.

ORNL-tr-2744 PC$3.75/MF$1.45
Gosudarstvennyj Komitet Po Ispol'Zovaniyu Atomnoj Ehnergii Sssr, Moscow. Inst. Atomnoj Ehnergii.
DEVELOPMENT OF A METHOD OF PROBING ELECTRIC AND MAGNETIC FIELDS IN A PLASMA WITH BEAMS OF CHARGED PARTICLES.
A. I. Morozov, B. V. Dauter, and S. M. Temchin. 1972, 35p
Translated by Martha Gerrard from IAE--2195.

Descriptors: (*Plasma diagnostics, *Beams), Beam-plasma systems, Charged particles, Electric fields, Electromagnetic fields, Electron beams, Magnetic fields, Plasma, Probes.

For abstract, see NSA 29 05, number 11610.

SLA-73-5700 PC$3.25/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
BEHAVIOR OF SOLID TARGETS IRRADIATED BY FOCUSED RELATIVISTIC ELECTRON BEAMS.
M. J. Clauser, A. J. Toepfer, and J. R. Freeman. 1973, 22p CONF-731009-5

Descriptors: (*Beam-plasma systems, *Fuel pellets), (*Plasma production, *Relativistic beam injection), Deuterium, Focusing, Solids, Targets, Tritium.

For abstract, see NSA 29 05, number 11642.

SLA-73-5704 PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
ELECTRON BEAM INITIATION OF PULSED FUSION.
G. Yonas. 1973, 19p CONF-731009-7

Descriptors: (*Plasma production, *Electron beams), Compression, Deuterium, Electron sources, Fuel pellets, Interactions, Research programs, Thermonuclear reactions, Tritium.

For abstract, see NSA 29 05, number 11643.

UCID-16371 PC$3.50/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
HIGH-DENSITY FUSION AND THE Z-PINCH.
C. W. Hartman. 19 Sep 73, 28p
Contract W-7405-eng-48

Descriptors: (*Linear z pinch devices, *Confinement), Energy storage, Impurities, Instability growth rates, Plasma density, Plasma instability, Thermonuclear reactor walls.

For abstract, see NSA 29 05, number 11602.

UCRL-50021-73-1 PC$7.60/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
LASER-FUSION PROGRAM. SEMIANNUAL REPORT, JANUARY--JUNE 1973.
S. S. Sussman. 22 Aug 73, 249p
Contract W-7405-eng-48

Descriptors: (*Lasers, *Research programs), (*Laser-produced plasma, Research programs), (*Laser-radiation heating, Research programs), (*Isotope separation, *Laser radiation), Plasma diagnostics.

For abstract, see NSA 29 05, number 11644.

20J. Quantum Theory

AD-775 193/6GA Reprint
Ohio State Univ Columbus Dept of Chemistry
THE MULTICHANNEL LOG-DERIVATIVE METHOD FOR SCATTERING CALCULATIONS,
B. R. Johnson. 1 May 73, 8p AFOSR-TR-74-0254
Grant AF-AFOSR-2272-72
Availability: Pub. in the Jnl. of Computational Physics, v13 n3 p445-449 Nov 73.

Descriptors: *Potential scattering, *S matrix, Schrodinger equation, Wave functions.
Identifiers: Riccati equation.

A new method for solving multichannel scattering problems is presented. The key to the method is an efficient algorithm for numerically solving the matrix Ricaiti equation for the logarithmic derivative of the wave function. This method has several advantages: it is simple to program, no special difficulties are encountered with closed channels, it is self-starting, the step size can be easily changed, no difficulties arise from starting the solution well inside the classically forbidden region, and it is somewhat more efficient of computer time than the matrix Numerov method for computing an S-matrix.

COO-1764-181 PC$4.75/MF$1.45
Minnesota Univ., Minneapolis (Usa). School of Physics and Astronomy; Ames Lab., Iowa (Usa).
DERIVATION OF GENERAL CONSERVATION LAWS AND WARD--TAKAHASHI IDENTITIES IN THE FUNCTIONAL INTEGRATION METHOD.
H. Suura, and B. L. Young. 1972, 55p

Descriptors: (*Quantum field theory, *Ward identity), Commutation relations, Conservation laws, Electromagnetic fields, Energy, Field equations, Functionals, Linear momentum, Perturbation theory, Series expansion, Tensors, Variational methods.

For abstract, see NSA 29 05, number 11725.

COO-2271-21 PC$3.75/MF$1.45
Columbia Univ., New York (Usa).
APPLICATION OF CONFORMAL SYMMETRY TO QUANTUM ELECTRODYNAMICS.
N. Christ. 1973, 35p

Descriptors: (*Quantum electrodynamics, *Conformal invariance), Correlation functions, Coupling constants, Diagrams, Perturbation theory, Series expansion, Vacuum polarization, Vertex functions.

For abstract, see NSA 29 05, number 11726.

JINR-E2-7485 PC$3.50/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
SEQUENCES OF PARASTATISTICS.
A. B. Govorkov. 1973, 26p
U.S. Sales Only.

Descriptors: (*Statistical mechanics, *Vectors), Boundary conditions, Green function, Ground states, Irreducible representations.

For abstract, see NSA 29 05, number 11715.

JINR-E2-7540 PC$3.25/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
SUPERPROPAGATOR REGULARIZATION OF THE S-MATRIX FOR CHIRAL LAGRANGIAN.
V. N. Pervushin. 1973, 24p
U.S. Sales Only.

Descriptors: (*S matrix, *Lagrangian function), (*Perturbation theory, S matrix), Chiral symmetry, Propagator.

For abstract, see NSA 29 05, number 11727.

JINR-E2-7562 PC$3.50/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
ULTRAVIOLET ASYMPTOTICS IN THE PRESENCE OF NONABELIAN GAUGE FIELDS.
V. V. Belokurov, D. I. Kazakov, D. V. Shirkov, A. A. Slavnov, and A. A. Vladimirov. 1973, 28p
U.S. Sales Only.

Descriptors: (*Yang-mills theory, *Ultraviolet divergences), Boundary conditions, Coupling, Coupling constants, Fermions, Gauge invariance, Interactions, Scalars, Spinors, Yukawa potential.

For abstract, see NSA 29 05, number 11728.

JINR-E4-7315 PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
APPLICATION OF DIAGRAM TECHNIQUE FOR HAMILTONIANS WITH THE COULOMB INTERACTION TO HUBBARD MODEL.
B. Westwanski. 1973, 10p
U.S. Sales Only.

Descriptors: (*Hamiltonian function, *Diagrams), (*Coulomb scattering, Diagrams), Green function, Wick theorem.

For abstract, see NSA 29 05, number 12461.

JINR-P2-7310 PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of High Energy.
MODELS OF NONLOCAL QUANTUM FIELD THEORY AND PARTICLES AND THEIR VALIDATION.
G. V. Vatagin. 1973, 12p
In Russian. U.S. Sales Only.

Descriptors: Locality, Particle models, Quantum field theory.

For abstract, see NSA 29 05, number 11729.

NP-19808 PC$3.50/MF$1.45
Tampere Univ. Of Tech. (Finland).
EXTENSION OF THE SPECIAL THEORY OF RELATIVITY AND A SUPERLUMINAL MODEL FOR ELEMENTARY PARTICLES. RESEARCH REPORT NO. 11, 1973.
R. Piirainen. Jan 73, 27p
U.S. Sales Only.

Descriptors: Boundary conditions, Causality, Elementary particles, Geometry, Lorentz transformations, Motion, Particle models, Quantum mechanics, Relativity theory, Signals, Stability, Tachyons, Uncertainty principle, Velocity.

For abstract, see NSA 29 05, number 11730.

N74-15056/6GA PC$11.50/MF$1.45
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
GRAVITATIONAL RADIATION THEORY.
M.A. Thesis - Rice Univ.
T. L. Wilson. Dec 73, 186p NASA-TM-X-58132, JSC-08587

Descriptors: *Field theory (Physics), *Gravitation theory, *Gravitational fields, Electromagnetic radiation, Magnetic charge density, Tensor analysis, Vector analysis.

For abstract, see STAR 1206

20K. Solid Mechanics

AD-774 846/9GA Not available NTIS
Shock and Vibration Information Center (Defense) Washington D C
THE SHOCK AND VIBRATION DIGEST, VOLUME 6, NUMBER 1, JANUARY 1974.
Jan 74, 91p
See also Volume 5, Number 12, AD-773 330.
Availability: Paper copy available from The Shock and Vibration Information Center, Code 8404, Naval Research Lab., Washington, D.C. 20375. Annual Subscription $25.00.

Descriptors: *Shock(Mechanics), *Vibration, *Reports, Matrices(Mathematics), Structural members, Resonant frequency, Structural response, Damping, Abstracts.
Identifiers: Finite element analysis.

Contents: Review of transfer matrix vibration analysis of skin-stringer structure -- part I; analysis and design; computer programs; environments; phenomenology; experimentation; components; systems.

AD-774 897/3GA Not available NTIS
Shock and Vibration Information Center (Defense) Washington D C
THE SHOCK AND VIBRATION DIGEST, VOLUME 6, NUMBER 2, FEBRUARY 1974.
Feb 74, 72p
See also Volume 6, Number 1, AD-774 846.
Availability: Paper copy available from The Shock and Vibration Information Center, Code 8404, Naval Research Lab., Washington, D.C. 20375. Annual Subscription $25.00.

Descriptors: *Shock(Mechanics), *Vibration, *Reports, Matrices(Mathematics), Structural members, Resonant frequency, Structural response, Damping, Abstracts.
Identifiers: Finite element analysis.

Contents: Review of transfer matrix vibration analysis of skin-stringer structure -- part 2; analysis and design; computer programs; environments; phenomenology; experimentation; components.

AD-775 057/3GA Reprint
Cornell Univ Ithaca N Y Dept of Engineering
VIBRATION ANALYSIS OF A RECTANGULAR PLATE,
M. Cengiz Dokmeci, and Bruno A. Boley. 1973, 18p
Sponsored in part by Office of Naval Research, Arlington, Va.

Descriptors: *Plates, *Vibration, Stresses, Buckling, Equations of motion.

Presented in the paper is a detailed analysis of the small, free oscillations of prestressed rectangular plates in both pre- and post-buckling ranges. The simply supported plate is stressed either thermally or by the uniaxial in-plane loads on two opposite edges, the other two edges are taken to be either freely movable or immovable, and all the edges are restrained to remain straight. Both the symmetrical and anti-symmetrical small vibration modes superimposed upon both primary- and secondary-buckling, and the coupling among these modes, are studied. A criterion for the existence of coupling is given. Some numerical results are presented. (Author)

AD-775 059/9GA Reprint
Northwestern Univ Evanston Ill
APPLIED THERMOELASTICITY,
Bruno A. Boley. 1974, 14p
Sponsored in part by Office of Naval Research. Arlington, Va.
Availability: Pub. in the Developments in Mechanics, v7 p3-16 nd.

Descriptors: *Thermal stresses, Thermomechanics, Thermal conductivity, Approximation, Melting, Solidification, Beams(Structural), Rings.
Identifiers: *Thermoelasticity.

A brief survey is given of several developments of recent years in the field of thermal stress analysis, with particular emphasis of these having relevance to practical calculations. (Author)

AD-775 079/7GA Reprint
Polytechnic Inst of Brooklyn N Y Dept of Aerospace Engineering and Applied Mechanics
FREE VIBRATIONS OF RING-STIFFENED TOROIDAL SHELLS.
Interim rept.,
Theodore Balderes, and Anthony E. Armenakas. 27 Jul 73, 10p AFOSR-TR-74-0259
Contract F44620-69-C-0072
Revision of report dated 23 Jan 73. Prepared in cooperation with Grumman Aerospace Corp., Bethpage, N.Y. See also report AD-743 306.
Availability: Pub. in the AIAA Jnl., v11 n12 p1637-1644 Dec 73.

Descriptors: *Shells(Structural forms), *Vibration, Rings, Toroids, Ring stiffened cylinders, Equations of motion, Buckling, Mathematical analysis.
Identifiers: Free vibrations, Fourier series, *Toroidal shells.

The problem of the free vibrations of ring-stiffened toroidal shells was formulated and the frequencies together with the corresponding mode shapes were obtained for different shell parameters and varying ring properties. The rings were treated as discrete members which were coupled to toroidal shell segments by imposing compatibility conditions. In the formulation of the shell equations, it was established that two types of uncoupled modes exist. A technique for obtaining eigenvalues, originally used in the buckling analysis of rotationally symmetric shells, was also shown to converge very rapidly in the present investigation. The convergence characteristics of the roots of unstiffened toroidal shells were studied as the number of harmonics retained was increased. Plots were established showing the effect of the shell parameters on the number of harmonics that must be retained for three-figure accuracy in the roots.

AD-775 115/9GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
A CONICAL SHELL OF LINEARLY VARIABLE THICKNESS UNDER THE EFFECT OF A NORMAL CONCENTRATED FORCE,
N. G. Guryanov, and Yu. P. Artyukhin. 31 Jan 74, 19p Rept no. FTD-HT-23-361-74
Edited trans. of Issledovaniya po Teorii Plastin i Obolochek (USSR) n8 p278-286 1972, by Louise E. Heenan.

Descriptors: *Shells(Structural forms), Loads(Forces), *Elastic properties, Partial differential equations, Numerical integration, Translations, USSR.

A nonsloping conical shell whose thickness varies linearly is examined. The shell is loaded by a normal concentrated force applied at point M(r', phi'). The initial system of equations reduces to two equations with constant coefficients. The equations are integrated using double trigonometric series which approximately correspond to the case of a freely supported shell.

AD-775 121/7GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
METHOD OF DESIGNING AN ORTHOTROPIC CYLINDRICAL SHELL UNDER CONCENTRATED LOAD,
L. I. Mogilevkin. 31 Jan 74, 11p Rept no. FTD-HT-23-348-74
Edited trans. of Issledovaniya po Teorii Plastin i Obolochek (USSR) v9 p260-265 1972, by K. L. Dion.

Descriptors: *Shells(Structural forms), *Loads(Forces), Partial differential equations, Computer programming, Translations, USSR.
Identifiers: Design, *Cylindrical shells.

The article develops a machine engineering method for designing an orthotropic cylindrical shell under a concentrated load.

AD-775 130/8GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
NUMERICAL EXECUTION OF THE BUBNOV-GALERKIN METHOD ON AN ELECTRONIC COMPUTER WITH THE SOLUTION OF NONLINEAR PROBLEMS OF THE THEORY OF SLOPING SHELLS,
N. I. Dedov, and N. N. Stolyarov. 31 Jan 74, 15p Rept no. FTD-HT-23-345-74
Edited trans. of Issledovaniya po Teorii Plastin i Obolochek (USSR) n9 p196-204 1972, by Louise E. Heenan.

Descriptors: *Shells(Structural forms), *Loads(Forces), Stresses, Numerical analysis, Translations, USSR.

AD-775 133/2GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
DIFFERENTIAL EQUATIONS OF THE THERMOELASTIC STATE OF SHELLS DURING THERMAL SHOCK ALONG A SURFACE,
E. A. Gotsulyak, V. I. Gulyayev, and V. K. Chibiryakov. 4 Feb 74, 17p Rept no. FTD-HT-23-796-74
Edited trans. of Prikladnaya Mekhanika (USSR) v9 n2 p32-41 1973, by Louise E. Heenan.

Descriptors: *Shells(Structural forms), Elastic properties, Thermal properties, Partial differential equations, Translations, USSR.
Identifiers: *Thermoelasticity.

AD-775 135/7GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio

ST. VENANT PROBLEM FOR A CONTINUOUS NONUNIFORM ANISOTROPIC BEAM,
S. G. Lekhnitskiy. 31 Jan 74, 16p Rept no. FTD-HT-23-339-74
Edited trans. of mono. Mekhanika Sploshnoi Sredy i Rodstvennye Problemy Analiza, Leningrad, 1972 p273-279, by K. L. Dion.

Descriptors: *Beams(Structural), *Elastic properties, Partial differential equations, Translations, USSR.
Identifiers: *Saint Venant principle.

The St. Venant problem for a uniform isotropic prismatic or cylindrical beam is one of the most simple problems in the classical linear theory of elasticity. However, it can be considerably complicated if the body is not uniform and isotropic, i.e., its elastic properties are different at various points and in various directions. Without considering the problem in all its generality, the author studies the case of an orthotropic beam, i.e., a beam which has at every point three orthogonal and respectively parallel planes of elastic symmetry, with absolute values and coefficients of elasticity assigned as continuous functions of two coordinates having derivatives to the second order inclusively.

AD-775 137/3GA PC$34.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
STUDY OF SYSTEMATIC ERRORS IN MEASURING ACCELERATION DUE TO FORCE OF GRAVITY USING THE FREE-FALL METHOD,
G. P. Arnautov, L. D. Gik, Ye. N. Kalish, and Yu. P. Stus. 1 Feb 74, 15p Rept no. FTD-HT-23-767-74
Edited trans. of mono. Izmerenie Absolyutnogo Znacheniya Gravitatsionnogo Uskoreniya, n.p., 1972 p37-47, by K. L. Dion.

Descriptors: *Falling bodies, *Acceleration, Force(Mechanics), Gravity, Equations of motion, Translations, USSR.

AD-775 202/5GA PC$4.25/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
REFINEMENT OF RELATIONSHIPS IN THE DYNAMICS OF MEDIUM THICKNESS SHELLS,
N. Z. Yakushev. 20 Feb 74, 25p Rept no. FTD-HT-23-367-74
Edited trans. of Issledovaniya po Teorii Plastin i Obolochek (USSR) n8 p410-427 1972, by K. L. Dion.

Descriptors: *Shells(Structural forms), *Statics, *Dynamics, Plastics, Equations of motion, Numerical analysis, Translations, USSR.

The making of plates and shells from different plastics can significantly reduce costs and facilitate the engineering constructions. The relative thickness of the plates and the shells is increased in this case. For this reason in many engineering problems the static and dynamic methods of analyzing shells based on the Kirchhoff-Love hypothesis are no longer applicable. As is known, the Kirchhoff-Love hypothesis permits neglecting the normal stresses perpendicular to the middle surface during comparison with tangential stresses to the surface, parallel to the middle, and also permits neglecting the inertia of rotation of the normal in the planes of the cross section. This work considers and evaluates by numerical examples compression of the normal, transverse shifts and inertia of shell rotation.

AD-775 445/0GA PC$3.25/MF$1.45
Army Materials and Mechanics Research Center Watertown Mass
LINEAR STABILITY OF ECCENTRICALLY STIFFENED CYLINDRICAL SHELLS UNDER AXIAL COMPRESSION,
Tien-Yu Tsui, and Chatta Lakshmikantham. Dec 73, 33p Rept no. AMMRC-TR-73-58

Descriptors: *Stiffened cylinders, *Buckling, *Stresses, Loads(Forces), Dynamics, Approximation, Cylindrical bodies.
Identifiers: *Cylindrical shells.

Linear stability of eccentrically stiffened cylindrical shells under axial compression has been investigated in the paper with an aim to establish the parameter ranges for the prevailing buckling modes. Charts delineating the zones of prevailing modes are presented in a parameter plane. Useful approximate relations are given for the bounds on parameters to predict a buckling mode for a shell in the moderate length range. (Author)

AD-775 526/7GA PC$3.25/MF$1.45
New York Univ Bronx Dept of Aeronautics and Astronautics
ON THE STABILITY OF CONTINUOUSLY SUPPORTED BEAMS.
Technical rept.,
Arnold D. Kerr. Nov 72, 29p Rept no. NYU-AA-72-35 AROD-8798.3-E
Grant DA-ARO-D-31-124-71-G91

Descriptors: *Beams(Structural), *Buckling, Boundary value problems, Elastic properties, Response, Numerical analysis.
Identifiers: Bifurcation theory.

When analyzing the stability of continuously supported beams, on foundations which exhibit a linear response, it is usually assumed in the literature that the buckling load is (P sub cr), the load at the bifurcation point from the straight state. This is based on the tacit assumption that in the post-buckling response curve, the load is monotonically increasing, away from the bifurcation point. The purpose of the present paper is to show that this assumption is not always justified. As example, the compressed semi-infinite elastic beam on a linear Winkler foundation is examined. It is shown that the post-buckling response curve exhibits a lower buckling load (P sub L) < (P sub cr). (Author)

AD-775 536/6GA PC$4.00/MF$1.45
Duke Univ Durham N C Dept of Civil Engineering
ELAS65 COMPUTER PROGRAM FOR EQUILIBRIUM PROBLEMS OF ELASTIC-THERMOPLASTIC SOLIDS AND STRUCTURES.
Interim technical rept. no. 2,
S. Utku, M. S. M. Rao, and G. J. Dvorak. Nov 73, 82p Rept no. Structural Mechanics Ser-15a AROD-9570.2-E
Grant DA-ARO-D-31-124-71-G103

Descriptors: *Mechanical properties, *Computer programs, Elastic properties, Plastic properties, Thermal properties, Structural properties, Stresses, FORTRAN, Instruction manuals.
Identifiers: ELAS65 computer program, Programming manuals, Thermoelasticity, Thermoplasticity, Elastoplasticity, FORTRAN 4 programming language, IBM 360 computers, IBM 370 computers.

A general purpose digital computer program, named ELAS65, for the in-core solution of the nonlinear equilibrium problems of solids and structures is described. This report contains the instructions for the user, the basic documentation of the program, and the theoretical background information, together with sample input/output. (Author)

N74-15618/3GA PC$3.00/MF$1.45
National Aeronautical Lab., Bangalore (India).
CALCULATION OF BUCKLING AND RESIDUAL STRESSES IN THE CASE OF NON-SYMMETRIC HEATING AND COOLING.
G. Z. Serebrennikov. 1972, 14p NAL-TR-96
Tran-Transl. Into English from Aviats. Tekh. (Kazan,), V. 13, No. 3, 1970 p 152-156.

Descriptors: *Bars, *Rectangular plates, *Thermal buckling, *Thermal stresses, Cooling, Fatigue (Materials), Stress analysis, Structural members, Temperature distribution.

For abstract, see STAR 1206

N74-15619/1GA PC$3.25/MF$1.45
National Aeronautical Lab., Bangalore (India).
OPTICAL POLARIZATION METHOD OF STUDYING THE STRESS STATE OF ANISOTROPIC BODIES.
V. P. Netrebko. Jan 72, 21p NAL-TR-102
Tran-Transl. Into English from Mekh. Tverdogo Tela (Ussr), No. 1, 1971 p 94-100.

Descriptors: *Orthotropic plates, *Photoelastic analysis, *Polymers, *Stress analysis, Anisotropic media, Elastoplasticity, Epoxy resins, Glass fibers.

For abstract, see STAR 1206

N74-15620/9GA PC$3.00/MF$1.45
National Aeronautical Lab., Bangalore (India).
A CASE OF THERMAL STRESS CONCENTRATION.
M. M. Sidlyar. Apr 71, 14p NAL-TR-94
Tran-Transl. Into English from an Ukr. Ssr, Inst. Mekhan., Teplovye Napryazh. V Elementakh Konstruktsii (Ussr), No. 9, 1970 p 70-78.

Descriptors: *Cavities, *Stress analysis, *Thermal stresses, Bessel functions, Fourier series, Stress concentration, Thermoelasticity.

For abstract, see STAR 1206

N74-15621/7GA PC$3.00/MF$1.45
National Aeronautical Lab., Bangalore (India).
TORSION OF A CONICAL SHELL, WEAKENED BY A LARGE CIRCULAR HOLE.
P. Z. Lugovoi. Aug 71, 11p NAL-TR-91
Tran-Transl. Into English from Prik. Mekhan. (Ussr), V. 7, No. 5 p 116-120.

Descriptors: *Cavities, *Conical shells, *Torsional stress, Boundaries, Curvature, Mathematical models.

For abstract, see STAR 1206

N74-15622/5GA PC$3.00/MF$1.45
National Aeronautical Lab., Bangalore (India).
INVESTIGATION OF STABILITY OF A SHELL BY THE METHOD OF FINITE DIFFERENCE.
V. V. Kabonov. Mar 72, 17p NAL-TR-120
Tran-Transl. Into English from TR. Vses. Sezda Teor. Prikl. Mekh. (Moscow), No. 1, 1971 p 24-29.

Descriptors: *Algorithms, *Cylindrical shells, *Finite difference theory, *Shell stability, Computer techniques, Loads (Forces), Matrices (Mathematics), Thermal stresses.

For abstract, see STAR 1206

N74-15623/3GA PC$3.00/MF$1.45
National Research Council of Canada, Ottawa (Ontario).
BUCKLING OF A PLATE UNDER A UNIFORM LINE LOAD ON ONE SIDE.
K. Kloeppel, and C. Wagemann. 1973, 17p NRC-TT-1712
Tran-Transl. Into English from der Stahlbau (West Germany), V. 33, No. 7, 1964.

Descriptors: *Boundary value problems, *Buckling, *Loads (Forces), *Plates (Structural members), Coefficients, Flange wrinkling, Stresses.

For abstract, see STAR 1206

N74-15624/1GA PC$3.00/MF$1.45
National Research Council of Canada, Ottawa (Ontario).
APPRAISAL OF THE BUCKLING STRENGTH OF TRANSVERSELY LOADED WEB PLATES.
W. Warkenthin. 1973, 11p NRC-TT-1713
Tran-Transl. Into English from der Stahlbau (West Germany), V. 34, No. 1, 1965 p 28-29.

Descriptors: *Elastic buckling, *Shear stress, *Webs (Supports), Computation, Loading moments, Loads (Forces), Structural strain.

For abstract, see STAR 1206

N74-15628/2GA PC$3.00/MF$1.45
National Aerospace Lab., Tokyo (Japan).
ON THE LINEAR THEORY OF THIN ELASTIC SHELLS.
S. Toda, and T. Koga. Jul 73, 15p NAL-TR-330T

Descriptors: *Elastic deformation, *Structural strain, *Thin walled shells, Applications of mathematics, Numerical analysis, Structural stability.

For abstract, see STAR 1206

N74-15630/8GA PC$6.25/MF$1.45
Stuttgart Univ. (West Germany). Inst. fuer Statik und Dynamik der Luft- und Raumfahrtkonstruktionen.
ASKA PART 3,1: MATERIAL NON-LINEARITIES. LECTURE NOTES WITH EXAMPLE PROBLEMS.
H. A. Balmer, and J. S. Doltsinis. 1972, 82p ISD-132

Descriptors: *Computer programs, *Creep properties, *Nonlinearity, *Plastic properties, *Structural analysis, Data processing, Elastoplasticity, Iterative solution, Stress functions, Stress-strain diagrams, Trusses.

For abstract, see STAR 1206

N74-15631/6GA PC$3.75/MF$1.45
Stuttgart Univ. (West Germany). Inst. fuer Statik und Dynamik der Luft- und Raumfahrtkonstruktionen.
SPLINE INTERPOLATION AND AUTOMATIC GENERATION OF INITIAL GEOMETRY FOR CABLE-NET STRUCTURES.
W. Knudson, and D. Nagy. 1973, 35p ISD-140

Descriptors: *Interpolation, *Nets, *Spline functions, *Structural analysis, *Surface properties, Cables (Ropes), Computerized design, Data smoothing, Geometry, Mesh, Numerical analysis.

For abstract, see STAR 1206

N74-15654/8GA PC$3.00/MF$1.45
National Aeronautical Lab., Bangalore (India).
THERMAL STRESS OF A SHALLOW SPHERICAL SHELL.
A. M. Novikova, and I. A. Motovilovets. Mar 72, 17p NAL-TR-113
Tran-Transl. Into English from Akad. Nauk Ukr. Ssr, Inst. Mekhan. Tepl. Napryazh. V Elementakh Konstrukt. (Ussr), No. 9, 1970 p 23-34.

Descriptors: *Shallow shells, *Spherical shells, *Stress analysis, *Thermal stresses, Laplace transformation, Matrices (Mathematics), Temperature distribution, Thermoelasticity.

For abstract, see STAR 1206

20L. Solid-State Physics

AD-774 914/6GA PC$3.00/MF$1.45
Colorado State Univ Fort Collins Dept of Physics
QUANTUM SIZE EFFECTS IN SEMIMETALS AND SEMICONDUCTORS.
Annual summary rept. 1 Feb 73-31 Jan 74, James R. Sites, and Carl W. Wilmsen. 31 Jan 74, 11p Rept no. SF1
Contract N00014-67-A-0299-0017

Descriptors: *Semiconducting films, *Quantum theory, *Indium antimonides, Semiconductors, Metalloids, Bismuth, Transport properties, Optical properties.
Identifiers: Metal insulator semiconductors.

The basic facilities for the thin film compound semiconductor program have been developed. Results were obtained in the areas of transport properties of bismuth and indium antimonide films, the theory of quantum size effects, insulating barriers with InSb devices, and optical constants of InSb films. (Author)

AD-774 967/4GA PC$7.50/MF$1.45
University of Southern California Los Angeles Electronic Sciences Lab
NEW METHODS FOR GROWTH AND CHARACTERIZATION OF GAAS AND MIXED III-V SEMICONDUCTOR CRYSTALS.
Technical rept. (Final), 1 Jul 70-30 Jun 73, William R. Wilcox, Worth P. Allred, Clarence R. Crowell, Agerico Esquivel, and Murray Gershenzon. 30 Jun 73, 344p* Rept no. USCEE-460
Grants DAHC15-70-G14, DAHC15-71-G6
Sponsored in part by Grant DAHC15-72-G7. See also AD-756 259.

Descriptors: *Semiconductors, *Gallium arsenides, *Crystal growth, Epitaxial growth, Manufacturing, Field effect transistors, Polishes, Dislocations, Doping, Impurities, Cathodoluminescence, Plastic deformation, Photoluminescence, Electrical properties, Hall effect.
Identifiers: Czochralski method, Bridgeman growth technique, Gradient freeze technique, Traveling heater method, Gallium nitrides.

The purpose of this program was to develop new and improved methods for the growth and characterization of gallium arsenide (GaAs) and mixed III-V semiconductor crystals. This was accomplished by laboratory experiments and related theoretical research. New Czochralski, floating zone melting, gradient freeze, and liquid epitaxy techniques for GaAs growth were developed and studied. The travelling heater method for GaAs and III-V alloys was studied. Material was characterized by spark-source mass spectrometry, ion microprobe mass analyzer, glow-discharge spectroscopy, infrared absorption, dislocation etching, X-ray topography, cathodoluminescence, photoluminescence, Hall measurements, photothreshold, and C-V-W measurements on Schottky barriers. Dislocations generated by bending were observed by cathodoluminescence and the effect on electrical properties determined. A new technique for measuring and controlling oxygen in gallium melts was developed and studied. (Author)

AD-774 991/4GA Reprint
Columbia Radiation Lab New York
THEORY OF SPECTRAL DIFFUSION DECAY USING AN UNCORRELATED-SUDDEN-JUMP MODEL,
S. R. Hartmann, and P. Hu. 23 Mar 73, 14p
Contract DAAB07-69-C-0383, Grant NSF-GH-34407
Availability: Pub. in Physical Review B, v9 n1 p1-13, 1 Jan 74.

Descriptors: *Electron paramagnetic resonance, Mathematical models.
Identifiers: Spin echoes.

The decay behavior of the one-pulse free-induction, two-pulse echo, and three-pulse stimulated-echo signals is calculated for a system of A spins, isolated from each other, whose local field fluctuates because of the uncorrelated flipping of a system of B spins randomly located. The decay behavior is obtained in closed form and is valid for all time. It was found that the dipolar line shape, which is the Fourier transform of the free-induction decay, is always narrowed by the flipping of the B spins. The two-pulse echo first decreases as the B-spin flip rate W increases and then increases as W is further increased. Except for the free-induction decay our formulas coincide in the limits of very short and very long times with those calculated by Klauder and Anderson and by Mims. (Author)

AD-774 992/2GA Reprint
Army Materials and Mechanics Research Center Watertown Mass
NUCLEAR SPIN RELAXATION STUDY OF THE ELECTRONIC STRUCTURE OF LEAD TELLURIDE,
Michael N. Alexander, Paul L. Sagalyn, Stephen D. Senturia, and C. Robert Hewes. 24 Jul 72, 10p Rept no. AMMRC-TR-74-2
Presented at the Conference on the Physics of IV-VI Compounds and Alloys, held at Pennsylvania Univ., Philadelphia, on 24-25 Mar 72.
Availability: Pub. in Jnl. of Nonmetals, v1 p251-256 1973.

Descriptors: *Semiconductors, *Band theory of solids, *Nuclear magnetic resonance, Lead compounds, Tellurides, Relaxation time.
Identifiers: *Lead tellurides, Spin lattice relaxation.

Measurements of the nuclear spin-lattice relaxation time (T1), the free induction decay time (T2*), and the spin echo decay time (T2) are reported for 207Pb in n- and p-type PbTe, for 105-295K. The measurements are related to a parameterized (k dot pi) nonparabolic model which was developed earlier in connection with Knight shifts in PbTe and Pb(1-x)Sn(x)Te. The model correctly predicts the dependence of T1 on carrier density at 105K but fails to account for the temperature dependence of T1 above 105K. (Modified author abstract)

AD-774 996/3GA PC$3.25/MF$1.45
California Univ Los Angeles Dept of Physics
COMMENT ON THE DE HAAS-VAN ALPHEN EFFECT AND THE SPECIFIC HEAT OF AN ELECTRON GAS,
Theordore Holstein, Richard E. Norton, and P. Pincus. Jan 73, 29p Rept no. UCLA/73/TEP/69
Contract N00014-69-A-0200-4032
Sponsored in part by National Science Foundation, Washington, D.C.

Descriptors: *Magnetic materials, *Electron gas, Mathematical models, Electrons, Magnetic fields, Electric current, Specific heat.
Identifiers: *De Haas-van Alphen effect.

A model electron gas is studied in order to provide a microscopic justification of the Shoenberg conjecture that the harmonic content of the de Haas-van Alphen oscillations of the magnetization M can properly be explained by replacing the applied field H in the elementary expression for M(H) by the total induction B = H + M. The model contains a current-current interaction between the electrons; and it is shown that the unscreened, long range nature of this interaction leads to a term in the low temperature specific heat proportional to T ln T. For a gas with terrestrial densities the coefficient of this anomalous term is very small and probably beyond detection. (Author)

AD-775 025/0GA Not available NTIS
National Research Council of Canada Ottawa (Ontario) Div of Physics
A SIMPLE AND ACCURATE EQUATION FOR THE SUPERCONDUCTING TRANSITION TEMPERATURE,
C. R. Leavens. 30 Jul 73, 5p NRC-13552
Availability: Pub. in the Solid State Communications, v13 p1607-1610 1973.

Descriptors: *Superconductivity, *Transition temperature, Equations, Canada.

Reasonable and consistent approximations are used to reduce the simplified form of the integral equations for the superconducting transition temperature used by Allender, Bray and Bardeen to a very simple, and remarkably accurate, equation for (T sub c). This equation is compared with the McMillan equation and found to give just as good agreement with experiment for intermediate coupling materials and considerably better agreement for strong-coupling materials. (Author)

AD-775 089/6GA PC$3.00/MF$1.45
Lehigh Univ Bethlehem Pa Inst of Fracture and Solid Mechanics
APPLICATION OF THE STRAIN-ENERGY-DENSITY THEORY TO FUNDAMENTAL FRACTURE PROBLEMS.
Technical rept.,
G. C. Sih. Nov 73, 20p Rept no. IFSM-73-49
AFOSR-TR-74-0188
Grant AF-AFOSR-2586-74
Presented at the Anniversary Meeting of the Society of Engineering Science (10th), Raleigh, N.C., Nov 73.

Descriptors: *Fracture(Mechanics), *Strain(Mechanics), *Composite materials, Crack propagation, Elastic properties, Plastic deformation, Numerical analysis.

The present study attempts to describe some essential features of the fracture problem associated with the analytical modeling of a crack. The topics chosen for this investigation are: (1) slanted crack, (2) crack tip notch effect, (3) material nonhomogeneity, and (4) fracture in three dimensions. A brief discussion is also given to crack propagation in the presence of plastic deformation. All the analyses are based on the strain-energy-density factor, S, concept which assumes fracture to occur in an element ahead of the crack when S reaches its critical value, Sc. (Author)

AD-775 118/3GA PC$4.50/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
STATUS AND PERSPECTIVES OF THE RADIATION PHYSICS OF SEMICONDUCTORS OF THE A3 B5 GROUP,
T. V. Masbovets. 17 Jan 74, 28p Rept no. FTD-HT-23-93-74
Edited trans. of Radiatsionnaya Fizika Nemetallicheskikh Kristallov. Sbornik Statei (USSR) v3 n1 p5-28 1971, by Frank C. Vaughn.

Descriptors: *Semiconductors, *Radiation effects, Defects(Materials), Annealing, Gallium arsenides, Gallium antimonides, Indium antimonides, Crystal lattices, Translations, USSR.
Identifiers: Indium arsenides.

AD-775 179/5GA Reprint
Montana State Univ Bozeman Dept of Physics
ELECTRONIC STRUCTURE AND SCATTERING PROPERTIES OF POTASSIUM IODIDE: PHOTOEMISSION,
Adrian D. Baer, and Gerald J. Lapeyre. 20 Feb 73, 6p AFOSR-TR-74-0215
Grant AF-AFOSR-2061-71
Prepared in cooperation with Wisconsin Univ., Madison. Synchrotron Radiation Lab. Contract F44620-70-0029.
Availability: Pub. in Physical Review Letters, v31 n5 p304-307, 30 Jul 73.

Descriptors: *Band theory of solids, *Photoelectric emission, Potassium compounds, Iodides, Emission spectra, Ultraviolet spectroscopy.
Identifiers: *Potassium iodides, Density of states.

Synchrotron radiation is used to obtain energy distributions of photoemitted electrons from KI above and below the threshold for hole-electron pair creation by the excited electrons. Because the inelastic scattering lengths are short (approximately = or < 15A) above the threshold and long (> 100A) below, the energy distribution of secondary electrons due to pair creation replicates the conduction-band density of states. (Author)

AD-775 181/1GA Reprint
Louisiana State Univ Baton Rouge Dept of Physics and Astronomy
MOMENTUM DISTRIBUTION OF ELECTRONS IN CHROMIUM, IRON, AND NICKEL,
J. Rath, C. S. Wang, R. A. Tawil, and J. Callaway. 6 Aug 73, 7p AFOSR-TR-74-0216
Grant AF-AFOSR-2020-71
Availability: Pub. in the Physical Review B, v8 n11 p5139-5142, 1 Dec 73.

Descriptors: *Chromium, *Iron, *Nickel, *Electrons, *Band theory of solids, Momentum, Statistical distributions, Compton scattering, Wave functions.

The Compton profiles of the electron momentum distribution in chromium, iron, and nickel are calculated using the wave functions obtained from self-consistent linear-combination-of-atomic-orbitals energy-band calculations. The results are compared with experiment. (Author)

AD-775 182/9GA Reprint
Texas Univ Austin Dept of Physics
ENERGY BANDS FOR THE (001) SURFACE OF ALUMINUM,
Ed Caruthers, Leonard Kleinman, and Gerald P. Alldredge. 30 May 73, 10p AFOSR-TR-74-0218
Grants AF-AFOSR-2308-72, NSF-GH-40371
Availability: Pub. in Physical Review B, v8 n10 p4570-4577, 15 Nov 73.

Descriptors: *Aluminum, *Energy bands, Thin films, Metal films, Fermi surfaces, Wave functions, Surface properties.
Identifiers: Face centered cubic lattices.

An energy-band calculation has been performed on a 13-layer film of (001) aluminum. Surface states are found at Gamma, M, and X in the two-dimensional Brillouin zone, and along the lines connecting these points. Wave functions are plotted and decay constants tabulated for some of these surface states. The charge density in the (001) direction has also been plotted for various positions in the planar unit cell, and for an average over the unit cell. Finally, the 13-layer energy bands are compared to a (001) projection of the three-dimensional energy bands, and effects of film thickness as well as the surface perturbation are shown. (Author)

AD-775 184/5GA Reprint
California Univ Irvine Dept of Physics
DAMPING MECHANISM OF POLARITONS IN GAP,
S. Ushioda, J. D. McMullen, and M. J. Delaney. 18 Apr 73, 6p AFOSR-TR-74-0220
Grant AF-AFOSR-2296-72
Availability: Pub. in Physical Review B, v8 n10 p4634-4637, 15 Nov 73.

Descriptors: *Gallium phosphides, Damping, Phonons, Single crystals, Temperature.
Identifiers: *Polaritons.

The authors have measured the temperature dependence of the polariton damping function Gamma(pi)(omega(pi), T for the polariton frequency omega(pi) approximately = 345/cm in GaP in the temperature range 2-300K. The temperature dependence of Gamma(pi)(omega(pi), T shows that the predominant mechanism of polariton damping at this frequency is a decay process of the polaritons into two acoustic phonons of approximate frequencies 242 and 103/cm via the third-order anharmonic interaction. Inelastic-neutron-scattering data show that these frequencies correspond to acoustic phonons, TA(X) and LA(X), near the X point of the Brillouin zone. Thus the present experiment establishes the predominant source of the contributions to the imaginary part of the phonon self-energy. (Author)

AD-775 188/6GA Reprint
California Univ San Diego La Jolla Dept of Physics
SUPERCONDUCTIVITY AND PHASE TRANSITIONS IN SINGLE-CRYSTAL AND POLYCRYSTAL ALPHA-U AT HIGH PRESSURE,
T. F. Smith , and E. S. Fisher. 13 Apr 73, 13p
AFOSR-TR-74-0240
Contract F44620-72-C-0017
Sponsored in part by Atomic Energy Commission, Washington, D.C. Prepared in cooperation with Argonne National Lab., Ill.
Availability: Pub. in Jnl. of Low Temperature Physics, v12 n5/6 p631-641 1973.

Descriptors: *Uranium, *Superconductivity, *Transition temperature, Phase transformations, High pressure, Phase diagrams.

The superconducting transition temperature of single-crystal and polycrystal uranium has been determined as function of hydrostatic pressure to 24 kbar. Although the general form of the Tc(P) variation is similar for the two types of material, features are present in the detailed behavior for the single-crystal samples which are not found for polycrystal samples. These features are presumed to be associated with the first-order transitions observed at zero pressure. A low-temperature phase diagram has been constructed and the electronic nature of the various phases is discussed. (Author)

AD-775 190/2GA Reprint
California Univ San Diego La Jolla Dept of Physics
PRESSURE DEPENDENCE OF TC FOR (AU(1-X)PD(X))GA2 ALLOYS,
T. F. Smith, R. N. Shelton, and J. E. Schirber. 5 Mar 73, 5p AFOSR-TR-74-0239
Contract F44620-72-C-0017
Sponsored in part by Atomic Energy Commission, Washington, D.C. Prepared in cooperation with Sandia Labs., Albuquerque, N. Mex.
Availability: Pub. in Physical Review B, v8 n7 p3479-3481, 1 Oct 73.

Descriptors: *Gold alloys, *Gallium alloys, *Superconductivity, Intermetallic compounds, Doping, Palladium, Transition temperature, Hydrostatic pressure.
Identifiers: *Gold intermetallics, *Gallium intermetallics.

The superconducting transition temperature for the alloys (Au(1-x)Pd(x))Ga2 with x = 0, 0.012, and 0.024 has been measured as a function of hydrostatic pressure to 24 kbar. The very marked discontinuity in Tc, which occurs at approximately 6kbar for x = 0 is displaced to lower pressure and becomes considerably broader as x is increased. This behavior is discussed in terms of the Fermi-surface transition previously proposed to explain de Haas-van Alphen and NMR measurements. (Author)

AD-775 191/0GA Reprint
California Univ San Diego La Jolla Dept of Physics
CRITERIA FOR SUPERCONDUCTING TRANSITION TEMPERATURES,
B. T. Matthias. 2 May 73, 5p AFOSR-TR-74-0238
Contract F44620-72-C-0017
Prepared in cooperation with Bell Telephone Labs., Murray Hill, N.J.
Availability: Pub. in Physica, v69 p54-56 1973.

Descriptors: *Superconductivity, *Transition temperature, Crystal structure, Phase transformations.

Crystallographic instabilities seem to be a necessary condition for high superconducting transition temperatures in multicomponent phases. (Author)

AD-775 192/8GA Reprint
California Univ San Diego La Jolla Dept of Physics
THE SUPERCONDUCTING ISOTOPE EFFECT OF IRON IN U6FE,
J. J. Engelhardt. 13 Jul 73, 4p AFOSR-TR-74-0237
Contract F44620-72-C-0017
Availability: Pub. in Solid State Communications, v13 p1355-1356 1973.

Descriptors: *Uranium alloys, *Superconductivity, Intermetallic compounds, Iron alloys, Transition temperature, Isotope impurities.
Identifiers: *Uranium intermetallics, Iron intermetallics.

The iron isotope effect on the superconducting transition temperature of the compound U6Fe was found to be very small or zero. (Author)

AD-775 194/4GA Reprint
University of Southern California Los Angeles Electronic Sciences Lab
SIDE-JUMP AND SIDE-SLIDE MECHANISMS FOR FERROMAGNETIC HALL EFFECT,
Jan Smit. 20 Nov 72, 4p AFOSR-TR-74-0214
Contract F44620-71-C-0067
Availability: Pub. in Physical Review B, v8 n5 p2349-2350, 1 Sep 73.

Descriptors: *Ferromagnetic materials, *Hall effect, Steady state, Band theory of solids.
Identifiers: *Spin orbit interactions.

It is shown that the 'side-jump' delta (vector r) = (vector p) x (vector mu)/2mce, caused by spin-orbit interaction, cannot give rise to a transverse velocity in the steady state, in which (dp/dt) = 0. (Author)

AD-775 319/7GA PC$4.50/MF$1.45
Science Applications Inc Arlington Va
MONTE CARLO CALCULATIONS OF DOSE DISTRIBUTION IN SEM IRRADIATED SEMICONDUCTOR STRUCTURES.
Final rept. 18 May-18 Oct 73,
William L. Chadsey. 18 Oct 73, 27p Rept no. SAI-73-567-AR NAD-CR-TR/7024/C74/64
Contract N00164-73-C-0517

Descriptors: *Metal oxide semiconductors, *Semiconductor devices, *Electron microscopy, *Radiation effects, Electron irradiation, Silicon, Capacitors, Transistors, Dose rate, Electron transport, Distribution, Monte Carlo method.

Monte Carlo calculations were performed to determine the two-dimensional dose distribution in a metal/oxide/silicon substrate structure irradiated by the electron beam from a scanning electron microscope (SEM). The objective was to investigate energy deposition in transistors neighboring an MOS capacitor test pattern irradiated by a SEM electron beam. The principal conclusion is that no damage to neighboring transistors is predicted - the dose in the oxide layer 2 microns from the boundary of the test pattern is four orders of magnitude smaller than the soe dose in the test pattern oxide for a 20 keV beam. Plots and tables of depth dose distribution, radial dose distribution, dose distribution near a rectangular target pattern, charge deposition distribution, and radial distribution of reflected charge are presented. (Author)

AD-775 367/6GA PC$6.00/MF$1.45
National Bureau of Standards Boulder Colo Cryogenics Div
THERMAL CONDUCTIVITY STANDARD REFERENCE MATERIALS FROM 6 TO 280K: VI. NBS SINTERED TUNGSTEN,
J. G. Hust. Jan 74, 59p Rept no. NBSIR-73-351

Descriptors: *Tungsten, *Thermal conductivity, *Standards, Electrical resistivity, Seebeck effect, Transport properties.
Identifiers: *Standard reference materials.

Thermal conductivity, electrical resistivity, Lorenz ratio, and thermopower data are reported for two specimens of NBS sintered tungsten for temperatures from 6 to 280K. Variability of this tungsten was studied by means of electrical resistivity and residual resistivity measurements on 39 specimens. These data indicate a material variability of about plus or minus 10% in thermal conductivity at helium temperatures. Above 90K variation in thermal conductivity is only about plus or minus 1%. To reduce the uncertainty caused by specimen variation at low temperatures, characterization by residual electrical resistivity data is described. By this procedure the low temperature uncertainty is reduced to about plus or minus 3%. (Author)

AD-775 389/0GA PC$3.75/MF$1.45
Intelcom Rad Tech San Diego Calif
STUDY OF THE EFFECTS OF RADIATION ON THE ELECTRICAL AND OPTICAL PROPERTIES OF HGCDTE,
Joseph F. Colwell, B. A. Green, Roland Leadon, Charles E. Mallon, and James A. Naber. 3 Dec 73, 62p Rept nos. RT-8027-004, Scientific-2 AFCRL-TR-73-0761
Contract F19628-72-C-0311

Descriptors: *Radiation effects, *Semiconductors, *Cadmium tellurides, *Electron irradiation, Mercury compounds, Infrared detectors, Annealing, Electrical conductivity, Hall effect, Photoconductivity.
Identifiers: *Mercury tellurides, Carrier mobility.

The report describes the results of experimental and theoretical investigation of the effects of electron irradiation on the electrical and optical properties of the alloy semiconductor HgCdTe. These results include measurements of the carrier concentration, Hall mobility, carrier lifetime, and photoconductive response for the preirradiation conditions, as a function of electron fluence and as a function of annealing temperature. The electron irradiations of these samples were performed at 80K with 5-MeV electrons and at annealing temperatures up to 350K. A model is developed to explain the changes in mobility, carrier concentration, and photoconductive response.

AD-775 396/5GA PC$5.00/MF$1.45
Office of Naval Research London (England)
CONFERENCE ON 'MAGNETIC BUBBLES' MEETING HELD AT IMPERIAL COLLEGE, LONDON ON 5 - 7 SEPTEMBER 1973.
Conference rept.,
Arthur H. Waynick. 19 Nov 73, 37p Rept no. ONRL-C-21-73

Descriptors: *Magnetic devices, *Symposia, Magnetic materials, Crystal growth, Epitaxial growth, Memory devices, Magnetic domains, Bubbles, Great Britain.
Identifiers: *Magnetic bubble domains, Chemical vapor deposition, Hydrothermal crystal growth, Magnetic film memories.

This is a report on a specialist conference on magnetic bubble technology. The material dealt with covers the device requirements of materials - substrates and epilayers; growth techniques - liquid plane epitaxy (LPE), chemical vapor deposition (CVD), and hydrothermal (also including amorphous films); physical characterization and technology. (Author)

AD-775 423/7GA PC$3.25/MF$1.45
Harry Diamond Labs Washington D C
GRUNEISEN DATA FROM THE FREE SURFACE VELOCITY OF THERMOELASTIC MATERIALS.
Technical rept.,
R. B. Oswald, F. B. McLean, D. R. Schallhorn, and T. R. Oldham. May 73, 36p Rept no. HDL-TR-1629

Descriptors: *Thermal shock, *Aluminum, *Copper, *Silicon, Germanium, Electron beams, Interferometry, Equations of state, Measurement, Surfaces.
Identifiers: Gruneisen parameter.

A technique is presented for the measurement of the Gruneisen parameter of a solid from the free surface velocity induced by pulsed energy deposition. The technique is used to obtain both temperature-dependent and temperature-independent Gruneisen data. The measurements employ a velocity interferometer to determine the free surface velocity of solids exposed to a pulsed electron beam. Results are presented for Al, Cu, Ge and Si in a temperature range where the Gruneisen parameter is constant. In all cases the results are in excellent agreement with the thermodynamic values. (Modified author abstract)

AD-775 424/5GA PC$3.25/MF$1.45
Harry Diamond Labs Washington D C
STUDIES RELATIVE TO POSSIBLE LASER PUMPED BY NUCLEAR BETA RAYS. I. OPTICAL SPECTRA OF LITMF4 DOPED WITH A RARE EARTH ION,
Clyde A. Morrison, and Donald C. Wortman. Oct 73, 27p Rept no. HDL-TR-1621

Descriptors: *Laser materials, *Lithium fluorides, *Solid state lasers, Doping, Holmium, Neodymium, Radiation effects, Beta particles, Neodymium lasers, Optical properties, Ytterbium compounds, Yttrium compounds, Thulium compounds, Annealing, Energy transfer, Atomic energy levels, Electron transitions.
Identifiers: *Thulium fluorides, Holmium lasers.

A study has been made of the optical spectra of single-crystal LiTmF4 doped with a rare earth ion with the objective of determining the feasibility of using this material as a nuclear pumped laser. The rare earth dopant would be pumped by the beta radiation in the nuclear decay of Tm170 artifically created by bombarding the non-radioactive crystal with thermal neutrons. The optical spectra were therefore recorded before and after the crystals were irradiated by nuclear energy. The principal results of the study are as given below. (Modified author abstract)

AD-775 473/2GA PC$3.25/MF$1.45
Ohio State Univ Research Foundation Columbus
LUMINESCENT MATERIAL PREPARATION AND SPECTROSCOPY.
Final rept. 1 Jul 70-30 Sep 73,
William W. Anderson, and Hong J. Chang. 20 Dec 73, 31p Rept no. OSURF-3032A1-TR-73F AROD-6835.6-E
Contract DAHC04-70-C-0041

Descriptors: *Semiconductors, *Cadmium sulfides, *Ion implantation, *Light emitting diodes, Single crystals, Semiconductor diodes, Schottky barrier devices, Electroluminescence, Blue, Electrical properties.

Phosphorus ion implanted CdS was analyzed using C-V, I-V, thermally stimulated current and photovoltaic measurements. Properly annealed diodes were shown to have a p-i-n structure. A low voltage blue electroluminescence was observed at 77K in ion implantation fabricated p-n junction diodes. A channeling effect was observed by analysis of C-V data. Many shallow energy levels were identified, some of which have been previously reported and some of which are new to this work. (Author)

AD-775 500/2GA Reprint
Army Electronics Command Fort Monmouth N J
ELASTIC-WAVE FORMULATION FOR ELECTROELASTIC WAVES IN UNBOUNDED PIEZOELECTRIC CRYSTALS,
Seymour Epstein. 29 Jun 72, 10p
Availability: Pub. in the Physical Review B, v7 n4 p1636,1644, 15 Feb 73.

Descriptors: *Piezoelectric crystals, *Elastic waves, Electrical properties, Elastic properties, Quartz, Lithium compounds, Niobates, Cadmium sulfides, Barium compounds, Sodium compounds, Niobates, Bismuth compounds, Germanium compounds, Oxides, Gallium arsenides.
Identifiers: Lithium niobates, Barium niobates, Sodium niobates, Bismuth oxides, Germanium oxides.

The equations describing the elastic behavior of plane-wave disturbances in an infinite piezoelectric crystal are reduced in form to those of a purely elastic medium in the quasistatic approximation. Various stiffened-elastic properties are numerically evaluated for an arbitrary nonpure mode and symmetry-related directions for alpha-quartz (class 32), LiNbO3 (3m), CdS (6mm), Ba2NaNb5O15 (2mm), Bi12GeO12 (23), and GaAs (-4,3m). The work offers a simplified approach to characterizing bulk and surface elastic-wave properties of electroelastic waves in piezoelectric crystals and of modally analyzing particular classes of piezoelectric structures. (Modified author abstract)

AD-775 516/8GA PC$3.00/MF$1.45
Connecticut Univ Storrs Dept of Physics
RADIATION DAMAGE IN SOLIDS AND PHONON SCATTERING.
Final rept. 1 Jul 70-30 Sep 73,
Paul G. Klemens. 31 Oct 73, 17p AROD-9190.10-P
Grants DA-ARO-D-31-124-70-G98, DA-ARO-D-31-124-71-G139

Descriptors: *Defects(Materials), *Radiation effects, *Test methods, Phonons, Scattering, Thermal conductivity, Surface waves, Attenuation.
Identifiers: Ultrasonic attenuation.

The report describes experimental and theoretical work on the use of phonon scattering techniques to study defects in solids. Low temperature thermal conductivity measurements were made on tin, tin-cadmium, sapphire, tourmaline and fluoroapatite in the range 4 to 77K. Work is described on improved techniques of generating surface waves and of measuring surface wave attenuation. Waves were generated using wedges and interdigital transducers on removable plaques. Attenuation changes were measured using insertion loss changes, and absolute values of attenuation were obtained by probing the beam using optical diffraction. Measurements were made on surfaces with bonded powder, and on quartz surfaces subject to particle irradiation. In the latter case the effect of irradiation was too small to be measured. Theoretical studies include radiative heat transport in solid composites and thermoelectric power of metals. (Author)

AD-775 522/6GA Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
ELECTROLUMINESCENT PHOSPHORS,
Elliott Schlam. 2 Apr 73, 9p
Revision of report dated 26 Feb 73.
Availability: Pub. in Proceedings of the IEEE v61 n7 p894-901 Jul 73.

Descriptors: *Display systems, *Electroluminescence, *Phosphors, *Zinc sulfides, Thin films, Manganese, Copper, Electrical properties, Optical properties.
Identifiers: Alphanumeric displays, Graphic displays.

A review of the properties of electroluminescent phosphors of the zinc sulfide family is presented. The properties of two particular configurations are discussed in detail: ac-excited evaporated films of Zns:Mn and dc-excited powder layers of ZnS:Mn,Cu. These configurations exhibit such properties as high efficiency, low-duty-cycle operation, high contrast, high discrimination ratio, and acceptable operating lifetimes. In addition, the basic technology can result in inexpensive and rugged devices, which may be fabricated in unlimited symbol configurations and in a wide range of sizes. (Modified author abstract)

AD-775 528/3GA Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
NUCLEAR RELAXATION IN NICKEL AND NICKEL ALLOYS,
R. L. Streever, and P. J. Caplan. 11 Dec 72, 8p
Revision of report dated 7 Aug 72.
Availability: Pub. in Physical Review B, v7 n9 p4052-4058, 1 May 73.

Descriptors: *Nickel, *Nickel alloys, *Nuclear resonance, Platinum alloys, Cobalt alloys, Manganese alloys, Relaxation time.
Identifiers: *Nuclear relaxation.

Nuclear relaxation times have been measured for 55Mn and 59Co in dilute Ni-based alloys and for 61Ni in Ni metal. Studies have been carried out at 4.2, 77K, and at room temperature using an externally applied field of about 6 kG. The signal recovery following saturation is found to be generally nonexponential and to depend on sample annealing. Relaxation-time studies have also been carried out for 195Pt in Ni and for 55Mn and 59Co in Fe. The complicated behavior in Ni is discussed and compared with that for the corresponding solutes in Fe. (Modified author abstract)

AD-775 530/9GA Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
PHOTOLUMINESCENCE OF GEL-GROWN PB(OH)I SINGLE CRYSTALS,
A. Schwartz, and J. C. O'Connell. 18 Dec 72, 2p
Revision of report dated 13 Nov 72.
Availability: Pub. in Jnl. of the Electrochemical Society, v120 n5 p697-698 May 73.

Descriptors: *Semiconductors, *Photoluminescence, Single crystals, Hydroxides, Crystal growth.
Identifiers: *Lead iodides.

Crystalline growth in gels containing a lead cation source and an iodine anion source will produce predominantly lead hydroxy-iodide with some lead iodide for gel pH greater than 7.0. Dennis et al. have reported the growth of lead hydroxy-iodide in alkaline sodium metasilicate gels along with a few basic properties of the material. The purpose of this paper is to report some recent photoluminescent measurements on this double salt.

AD-775 531/7GA Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
THE PRESSURE DEPENDENCE OF SUPERCONDUCTING ENERGY GAPS FROM HIGH PRESSURE CRITICAL FIELD MEASUREMENTS,
F. Rothwarf, and L. W. Dubeck. 10 Jul 73, 7p
Availability: Pub. in the Solid State Communications, v13 p1645-1649 1973.

Descriptors: *Superconductors, *Energy gap, Tin, Indium, Zinc, Aluminum, Cadmium, Gallium, Thorium, Hydrostatic pressure.
Identifiers: Critical field.

It was found that the use of the Toxen relationship permits one to interpret as pressure variations of the energy gap the previously unexplained small deviations from the similarity principle found in high pressure critical field measurements.

CEA-CONF-2239 PC$3.25/MF$1.45
FIRST RESULTS OBTAINED AT LETI IN TRANSMISSION ELECTRON MICROSCOPY ON THE DEFECTS CREATED BY IONIC IMPLANTATION OF EXP 31 P IN SILICON (111) AND THEIR BEHAVIOR IN THE COURSE OF SEVERAL ANNEALINGS.
R. Truche. 24p CONF-720990-7
In French. U.S. Sales Only.

Descriptors: (*Silicon, *Ion implantation), Annealing, Dislocations, Electron microscopy, Interstitials, Kev range 10-100, Phosphorus ions, Physical radiation effects, Recrystallization, Vacancies.

For abstract, see NSA 29 05, number 10757.

CEA-CONF-2245 PC$3.00/MF$1.45
CHARACTERIZATION OF PROFILES IMPLANTED IN MULTILAYERS BY MEANS OF THE CASTAING--SLODZIAN ANALYZER.
J. Bernard, J. L. Combasson, and N. Hillaret. 3 Nov 72, 15p CONF-720990-8
In French. U.S. Sales Only.

Descriptors: (*Silicon, *Ion implantation), (*Silicon oxides, Ion implantation), (*Silicon nitrides, Ion implantation), Boron ions, Depth, Interfaces, Layers, Spatial distribution.

For abstract, see NSA 29 05, number 10758.

COM-74-50163/6GA Not available NTIS
National Bureau of Standards, Washington, D.C.
OBSERVATION OF MAGNETIC DOMAINS IN NICKEL USING THE SCANNING ELECTRON MICROSCOPE.
Final rept.,
D. E. Newbury, H. Yakowitz, and N. C. Yew. 1974, 1p
Pub. in Applied Physics Letters, v24 n2 p98, 15 Jan 74.

Descriptors: *Nickel, *Magnetic domains, Electron microscopy.
Identifiers: Scanning electron microscopy.

Scanning electron microscope (SEM) observation of magnetic domains in a polycrystalline pure nickel sheet was made possible through the use of a 50-kV accelerating potential. The contrast was unobservable in an SEM capable of only a 30-kV accelerating potential.

CONF-731104-8 PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
EXCHANGE INTERACTION IN DILUTE YTTRIUM-RARE EARTH ALLOYS.
R. M. Nicklow, and N. Wakabayashi. 1972, 8p

Descriptors: (*Yttrium base alloys, *Magnetic properties), (*Gadolinium alloys, Magnetic properties), (*Terbium alloys, Magnetic properties), (*Dysprosium alloys, Magnetic properties), Binary alloy systems, Dilute alloys, Ultralow temperature, Holmium alloys.

For abstract, see NSA 29 05, number 10683.

COO-1569-108 PC$8.00/MF$1.45
Minnesota Univ., Minneapolis (Usa). Tate Lab. Of Physics.
HYPERFINE ENHANCED NUCLEAR MAGNETIC COOLING IN PRCU SUB 6 .
R. M. Swinehart, and W. Weyhmann. Dec 73, 116p
Contract AT(11-1)-1569

Descriptors: (*Copper base alloys, *Adiabatic demagnetization), (*Praseodymium alloys, Adiabatic demagnetization), (*Cryogenics, Adiabatic demagnetization), Crystal structure, Hyperfine structure, Intermetallic compounds, Magnetic fields, Magnetic susceptibility, Specific heat.

For abstract, see NSA 29 05, number 11339.

COO-2315-1 PC$3.00/MF$1.45
Dartmouth Coll., Hanover, N.H. (Usa).
THEORY OF ELECTRON--PHONON SCATTERING EFFECTS IN METALS. PROGRESS REPORT, MARCH 1--NOVEMBER 30, 1973.
W. E. Lawrence. 1973, 8p
Contract AT(11-1)-2315

Descriptors: (*Metals, *Phonons), Anisotropy, Electric conductivity, Electrons, Matthiessen rule, Scattering.

For abstract, see NSA 29 05, number 12451.

COO-3150-18 PC$3.00/MF$1.45
Cornell Univ., Ithaca, N.Y. (Usa). Lab. Of Atomic and Solid State Physics.
EXCHANGE AND CRYSTAL FIELD PARAMETERS FROM TESR OF AL:ER. REPORT NO. 2125.
J. F. Siebert, S. A. Dodds, and R. H. Silsbee. Nov 73, 8p
Contract AT(11-1)-3150

Descriptors: (*Aluminium, *Impurities), Coupling, Crystal doping, Crystal field, Electron spin resonance, Electronic structure, Erbium, Transmission.

For abstract, see NSA 29 05, number 12453.

COO-3151-31 PC$5.25/MF$1.45
Cornell Univ., Ithaca, N.Y. (Usa). Materials Science Center.
STUDY OF IMPURITY MODES IN ALKALI HALIDES THROUGH LOW TEMPERATURE SPECIFIC HEAT AND THERMAL CONDUCTIVITY MEASUREMENTS.
P. P. Peressini. Aug 73, 65p

Descriptors: (*Potassium chlorides, *Impurities), (*Potassium bromides, Impurities), (*Potassium iodides, Impurities), (*Rubidium chlorides, Impurities), Energy levels, Specific heat, Thermal conductivity, Tunnel effect, Ultralow temperature, Hydroxides, Lithium compounds, Cyanides.

For abstract, see NSA 29 05, number 12454.

COO-3169-17 PC$3.75/MF$1.45
Cornell Univ., Ithaca, N.Y. (Usa). Dept. Of Materials Science and Engineering.
STUDY OF THE INTERACTION BETWEEN MAGNETIC FLUXOIDS AND CRYSTAL DEFECTS IN TYPE II SUPERCONDUCTORS.
E. J. Kramer. 31 Oct 73, 31p
Contract AT(11-1)-3169

Descriptors: (*Niobium, *Superconductivity), (*Niobium base alloys, Superconductivity), (*Molybdenum alloys, Superconductivity), Crystal defects, Fast neutrons, Magnetic flux, Type-ii superconductors.

For abstract, see NSA 29 05, number 11320.

COO-3480-2 PC$4.00/MF$1.45
State Univ. Of New York, Buffalo (Usa).
(DEVELOPMENT AND USE OF A LIQUID-HELIUM CRYOSTAT). FINAL REPORT, JUNE 15, 1969--JUNE 14, 1972.
P. Coppens. 1973, 37p
Contract AT(11-1)-3480

Descriptors: (*Cryostats, *Testing), Fabrication, Helium i, Helium ii.

For abstract, see NSA 29 05, number 11340.

COO-623-194 PC$3.50/MF$1.45
Case Western Reserve Univ., Cleveland, Ohio (Usa). Dept. Of Physics; Washington Univ., Seattle (Usa). Dept. Of Physics.
SPIN--WAVE SPECTRUM OF AN AMORPHOUS FERROMAGNET.
J. E. Gubernatis, and P. L. Taylor. 1973, 27p

Descriptors: (*Ferromagnetic materials, *Spin waves), Amorphous state, Perturbation theory, Spectra.

For abstract, see NSA 29 05, number 12444.

COO-623-201 PC$3.25/MF$1.45
Case Western Reserve Univ., Cleveland, Ohio (Usa).
SOLID STATE PHYSICS PROGRAM. ANNUAL PROGRESS REPORT.
Nov 73, 24p
Contract AT(11-1)-623

Descriptors: (*Films, *Research programs), (*Dielectric properties, Research programs), (*Solids, Research programs), (*Metals, *Magnetoresistance), Laue method, Measuring methods, Monocrystals, Orientation, Surfaces.

For abstract, see NSA 29 05, number 12447.

GEAP-10546 PC$3.50/MF$1.45
General Electric CO., San Jose, Calif. (Usa). Nuclear Fuels Dept.
PART I. THEORY REPORT FOR CREEP-PLAST COMPUTER PROGRAM: ANALYSIS OF TWO-DIMENSIONAL PROBLEMS UNDER SIMULTANEOUS CREEP AND PLASTICITY.
Y. R. Rashid. Jan 72, 28p
Contract W-7405-eng-26

Descriptors: (*Computer codes, *C codes), (*Creep, *Two-dimensional calculations), (*Plasticity, Two-dimensional calculations), Equations of state, Finite element method, Metals, Stainless steels, Strains, Stresses.

For abstract, see NSA 29 05, number 12417.

GEAP-13262 PC$4.50/MF$1.45
General Electric CO., San Jose, Calif. (Usa). Atomic Power Equipment Dept.
PART II. USER'S MANUAL FOR CREEP-PLAST COMPUTER PROGRAM.
Y. R. Rashid. Mar 72, 50p
Contract W-7405-eng-26

Descriptors: (*Computer codes, *C codes), (*Creep, Computer codes), (*Plasticity, Computer codes), Equations of state, Fortran, Manuals, Metals.

For abstract, see NSA 29 05, number 12418.

IS-T-590 PC$3.75/MF$1.45
Ames Lab., Iowa (Usa).
VISUAL EFFECTS OF SWITCHING 0.15AS--0.12GE--0.73TE GLASS.
D. E. Eckels. Dec 73, 32p
Contract W-7405-eng-82

Descriptors: (*Germanium alloys, *Dielectric properties), (*Arsenic alloys, Dielectric properties), (*Tellurium alloys, Dielectric properties), (*Glass, Dielectric properties), Electric conductivity, Electric probes, Filaments, Photography, Switches, Transition temperature.

For abstract, see NSA 29 05, number 12458.

IS-T-615 PC$5.75/MF$1.45
Ames Lab., Iowa (Usa).
THERMAL EXPANSION OF POTASSIUM FROM 2 K TO 320 K.
D. R. Schouten. Dec 73, 74p
Contract W-7405-eng-82

Descriptors: (*Potassium, *Thermal expansion), Grueneisen constant, Lattice parameters, Low temperature, Medium temperature, Temperature dependence, Thermodynamic properties, Ultralow temperature, Very low temperature, Volume.

For abstract, see NSA 29 05, number 12459.

JINR-E4-7417 PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
ELECTRON--PHONON MASS ENHANCEMENT IN TRANSITION METALS.
W. John. 1973, 8p
U.S. Sales Only.

Descriptors: (*Transition elements, *Mass), Electrons, Phonons.

For abstract, see NSA 29 05, number 12462.

JUL-942-FF PC$5.50/MF$1.45
Kernforschungsanlage Juelich G.M.B.H. (F.R. Germany). Inst. Fuer Festkoerperforschung.
INVESTIGATION OF LATTICE DISTORTIONS OF OXYGEN INTERSTITIALS IN NIOBIUM BY X-RAY SCATTERING.
P. Wombacher. Apr 73, 69p
In German. U.S. Sales Only.

Descriptors: (*Niobium, *Crystal lattices), (*Oxygen, *Interstitials), Anisotropy, Bragg reflection, Defects, High temperature, Lattice parameters, Medium temperature, Monocrystals, Trace amounts, Ultralow temperature, X-ray diffraction.

For abstract, see NSA 29 05, number 10690.

KFKI-73-54 PC$3.00/MF$1.45
Kozponti Fizikai Kutato Intezet, Budapest (Hungary).
ELECTRICAL BEHAVIOR OF THIN LAYER AU--POLYETHYLENE--AL SANDWICHES.
J. Gazso. 9p
U.S. Sales Only.

Descriptors: (*Polyethylenes, *Electrical properties), (*Switches, Polyethylenes), Electric conductivity, Films, Layers.

For abstract, see NSA 29 05, number 12464.

N74-15399/0GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SUITABILITY OF THE RARE-EARTH COMPOUNDS DY2TI2P7 AND GD3AL5P56 FOR LOW TEMPERATURE (4K-20K) MAGNETIC REFRIGERATION CYCLE.
D. J. Flood. 1973, 8p NASA-TM-X-71493, E-7847
Conf-Presented at 19TH Ann. Conf. On Magnetism, Boston, 13-16 Nov. 1973; Sponsored by AM. Inst. Of Phys. And by Magnetic Soc. Of IEEE.

Descriptors: *Magnetization, *Rare earth compounds, *Refrigerating, Dysprosium, Entropy, Gadolinium, Ground state, Low temperature physics, Magnetic measurement.

For abstract, see STAR 1206

N74-15400/6GA PC$7.75/MF$1.45
Southampton Univ. (England). Inst. of Sound and Vibration Research.
THE CHARACTERISATION OF WAVE PROPAGATION MECHANISMS USING TRANSIENT EXCITATION: CONTINUOUS SYSTEMS AND THE EFFECTS OF DISPERSION.
P. J. Holmes. Jun 73, 111p ISVR-TR-62
Subm-Sponsored by Min. Of Defence.

Descriptors: *Transient loads, *Wave dispersion, *Wave excitation, *Wave propagation, Acoustic propagation, Bars, Computerized simulation, Correlation coefficients, Flexing, Frequency response, Sweep frequency.

For abstract, see STAR 1206

N74-15434/5GA PC$4.75/MF$1.45
Clark Univ., Worcester, Mass. Dept. of Physics.

EXPERIMENTAL INVESTIGATION OF THE CRITICAL MAGNETIC FIELDS OF TRANSITION METAL SUPERCONDUCTORS.
Final Report, 1 Jun. 1972 - 31 May 1973.
J. P. Mcevoy. 31 May 73, 52p NASA-CR-120127
Contract NAS8-28900

Descriptors: *Magnetic fields, *Superconductors, *Transition metals, Alternating current, Direct current, Electric potential, Nucleation.

For abstract, see STAR 1206

N74-15435/2GA PC$3.75/MF$1.45
Notre Dame Univ., Ind. Dept. of Electrical Engineering.
ELECTRODE MATERIALS FOR CHARGE COUPLED DEVICES.
W. T. J. Gajda. Oct 73, 31p NASA-CR-132348
Contract NAS1-12468

Descriptors: *Charge carriers, *Electrodes, *Semiconductor devices, *Silicon, Electrical properties, Optical properties.

For abstract, see STAR 1206

N74-15436/0GA PC$3.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
THE EFFECT OF SURFACE CONDITIONS ON REFLECTION AND SCINTILLATION SPECTRA OF CDS CRYSTALS.
M. S. Brodin, A. V. Kritsky, E. N. Myasnikov, M. I. Strashnikova, and L. A. Shlyakhova. Jan 74, 14p NASA-TT-F-15242
Contract NASW-2481
Tran-Transl. Into English from Ukr. Fiz. Zh. (Kiev), V. 18, May 1973 p 824-829.

Descriptors: *Cadmium sulfides, *Reflection, *Scintillation, Low temperature, Surface properties.

For abstract, see STAR 1206

N74-15438/6GA PC$3.50/MF$1.45
Office National d'Etudes et de Recherches Aerospatiales, Toulouse (France). Dept. d'Etudes et de Recherches en Technologie Spatiale.
ROLE OF FRIEDEL OSCILLATIONS IN THE METAL INTERFACIAL ENERGY ROLE DES OSCILLATIONS DE FRIEDEL DANS L'ENERGIE D'INTERFACE DES METAUX.
D. Rouhani, and R. Schuttler. Jul 73, 29p ONERA-DERTS-NT-02-73
Language in French.

Descriptors: *Crystal oscillators, *Interfacial energy, *Interfacial tension, Electron density (Concentration), Electron gas, Gas-solid interfaces, Metal bonding, Metal surfaces, Solid-solid interfaces, Surface energy, Surface reactions.

For abstract, see STAR 1206

N74-15439/4GA PC$3.00/MF$1.45
National Physical Lab., Teddington (England). Div. of Quantum Metrology.
A TEST OF THE MATERIAL INDEPENDENCE OF THE AC JOSEPHSON EFFECT.
J. C. Gallop. Aug 73, 14p NPL-QU-25

Descriptors: *Electric fields, *Flux quantization, *Josephson junctions, *Superconductors, Magnetic flux, Null zones, Periodic variations, Ring currents, Thermal noise.

For abstract, see STAR 1206

N74-15595/3GA PC$7.75/MF$1.45
Toronto Univ. (Ontario). Inst. for Aerospace Studies.
MATERIAL DAMPING AND ITS ROLE IN LINEAR DYNAMIC EQUATIONS.
W. B. Graham. Mar 73, 112p UTIAS-36
Subm-Sponsored by Commun. Res. Center.

Descriptors: *Elastic damping, *Linear equations, Anelasticity, Creep analysis, Equations of motion, Stress relaxation, Viscoelasticity.

For abstract, see STAR 1206

RLO-2225-T-13-19 PC$5.75/MF$1.45
Washington Univ., Seattle (Usa). Coll. Of Engineering.
STUDY OF PHASE TRANSFORMATIONS AND SUPERCONDUCTIVITY. ANNUAL PROGRESS REPORT.
V. Chandrasekaran, W. Cotton, S. Narasimhan, R. Taggart, and D. H. Polonis. 15 Oct 73, 73p
Contract AT(45-1)-2225

Descriptors: (*Titanium base alloys, *Phase transformations), (*Zirconium base alloys, Phase transformations), (*Niobium alloys, Phase transformations), (*Chromium alloys, Phase transformations), Electric conductivity, Magnetic flux, Superconductivity, Transition temperature, Molybdenum alloys.

For abstract, see NSA 29 05, number 11323.

SLA-73-615 PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
RADIATION-PRODUCED ELECTROMAGNETIC RESPONSE OF A DIELECTRIC-FILLED CYLINDRICAL CAVITY: A COMPARISON OF THEORY AND EXPERIMENT.
F. B. Brumley, D. C. Evans, and D. L. Mangan. Dec 73, 37p
Contract AT(29-1)-789

Descriptors: (*Dielectric materials, *Physical radiation effects), (*Cavities, Physical radiation effects), Cylinders, Electric fields, Gamma radiation, Liquids, Magnetic fields, Spatial dose distributions.

For abstract, see NSA 29 05, number 10284.

SLAC-Trans-161 PC$4.25/MF$1.45
Stanford Linear Accelerator Center, Calif. (Usa).
FIELD EMISSION, THE NOTTINGHAM EFFECT, AND ENHANCEMENT OF A MAGNETIC FIELD IN LEAD OR NIOBIUM SUPERCONDUCTING CAVITIES. CHAPTER 2. HEATING OF SUPERCONDUCTING ASPERITIES BY THE NOTTINGHAM EFFECT IN INTENSE HIGH FREQUENCY FIELDS.
H. Bergeret. 43p
Translated by H. Hobart from a doctoral dissertation presented to the University of Paris, Orsay Center.

Descriptors: (*Lead, *Field emission), (*Niobium, Field emission), Cavities, Heating, Magnetic fields, Superconductivity, Superconductors.

For abstract, see NSA 29 05, number 11324.

UCRL-74365 PC$3.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
DIFFUSION PATH NETWORKS IN THE WURTZITE LATTICE.
R. H. Condit. 15 Oct 73, 13p CONF-730956-2

Descriptors: (*Hcp lattices, *Diffusion), (*Beryllium oxides, Diffusion), (*Zinc oxides, Diffusion), Activation energy, Anions, Interstitials, Kinetics, Vacancies.

For abstract, see NSA 29 05, number 12491.

20M. Thermodynamics

AD-775 056/5GA Reprint
Northwestern Univ Evanston Ill Technological Inst
ON THE USE OF SUPERPOSITION IN THE APPROXIMATE SOLUTION OF HEAT CONDUCTION PROBLEMS,
Bruno A. Boley. 5 Apr 73, 8p
Revision of report date 6 Apr 72.
Availability: Pub. in the International Jnl. of Heat and Mass Transfer, v16 p2035-2041 1973.

Descriptors: *Thermal conductivity, Integrals, Approximation, Thermal stresses.

The use of convolution integrals and of the method of images, applied to approximate basic solutions, is investigated. The value of these techniques in deriving approximate solutions of heat conduction problems is discussed, and their accuracy, relative to both known exact solutions and other approximate ones, is assessed. (Author)

AD-775 058/1GA Reprint
Cornell Univ Ithaca N Y Dept of Theoretical and Applied Mechanics
A PROBLEM IN HEAT CONDUCTION OF MELTING PLATES,
B. A. Boley, and Y. F. Lee. 1971, 9p
Sponsored in part by Office of Naval Research, Arlington, Va.
Availability: Pub. in Letters in Applied and Engineering Sciences, v1 n1 p25-32 1971.

Descriptors: *Thermal conductivity, *Melting, *Plates, Differential equations, Distribution functions.

A short-time solution for a plate melting (or solidifying) under an applied heat-input proportional to t sup (n/4), where n is an integer and t is time, is presented. The melted portion remain stationary upon formation, and the solid is initially at the melt temperature. The results obtained are required for the solution of the practically important case of surface temperature proportional to t sup (n/2) for all values of n. (Author)

AD-775 291/8GA Reprint
Oregon Univ Eugene Dept of Physics
EXCITATION SPECTRUM OF HELIUM II: A SERIES REPRESENTATION,
J. S. Brooks, and R. J. Donnelly. 3 Oct 73, 4p
AFOSR-TR-74-0207
Grants AF-AFOSR-1999-71, NSF-GH-35898
Prepared in cooperation with Neils Bohr Inst., Copenhagen (Denmark).
Availability: Pub. in Physics Letters, v46A n2 p111-112, 3 Dec 73.

Descriptors: *Helium, Excitation, Spectra, Thermodynamics, Series(Mathematics), Phonons.

A series representation is described which has pressure dependent phonon dispersion, and which is consistent with neutron scattering and calorimetric data. (Author)

COM-74-10495/1GA Reprint
Delaware Univ., Newark. Coll. of Marine Studies.
STOCHASTIC OPTIMIZATION OF CONVECTIVE-FIN DESIGN,
B. L. Marsh, and F. A. Costello. Nov 73, 8p DEL-SG-1-73 NOAA-74012804
Grant NSF-GH-109
Pub. in Jnl. of Heat Transfer, Transactions of ASME Paper n73-HT-O p1-5 Nov 73.

Descriptors: *Cooling fins, Convection, Heat transfer, Probability density functions, Probability theory, Design criteria, Safety engineering.

In the design of convective fins, stochastic variations in fin dimensions have tradionally been handled by the use of safety factors. Often this process results in a multiplication of safety factors and thus an overly expensive design. This paper presents a probabilistic approach that not only analyzes the probability of system failure but also uses this analysis to synthesize the optimal design. Four methods of varying accuracy and difficulty

are described and compared. The method based on the RMS approximation for the variances appears to be most useful for design purposes. (Author)

COO-1569-100 PC$10.25/MF$1.45
Minnesota Univ., Minneapolis (Usa). School of Physics and Astronomy.
OBSERVATION OF CIRCULATION IN ROTATING SUPERFLUID HELIUM.
S. F. Kral. Mar 73, 163p
Contract AT(11-1)-1569

Descriptors: (*Helium ii, *Superfluidity), Mechanical vibrations, Rotation, Velocity, Wires.

For abstract, see NSA 29 05, number 11314.

COO-1569-103 PC$6.00/MF$1.45
Minnesota Univ., Minneapolis (Usa).
FLUCTUATION EFFECTS ON THE CONDUCTIVITY OF NB AND NBN FILMS.
L. A. Chard. Jul 73, 78p
Contract AT(11-1)-1569

Descriptors: (*Niobium, *Superconductivity), (*Niobium nitrides, Superconductivity), Electric conductivity, Films, Magnetic fields, Thickness, Transition temperature, Variations.

For abstract, see NSA 29 05, number 11315.

COO-1569-110 PC$5.25/MF$1.45
Minnesota Univ., Minneapolis (Usa).
THEORY OF PHASE SEPARATION IN QUANTUM CRYSTAL ALLOYS.
W. Huang. Dec 73, 65p

Descriptors: (*Helium 3, *Phase diagrams), (*Helium 4, Phase diagrams), Crystals, Entropy, Free energy, Thermodynamic properties.

For abstract, see NSA 29 05, number 11316.

ITF-73-76-P PC$4.50/MF$1.45
An Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
DENSITY MATRICES OF LIQUID HE SUB 4 AT LOW TEMPERATURES.
I. A. Vakarchuk. 1973, 48p
In Russian. U.S. Sales Only.

Descriptors: (*Helium 4, *Density matrix), Bosons, Boundary conditions, Corrections, Distribution, Distribution functions, Ground states, Interactions, Linear momentum, Liquids, Low temperature, Matrices, Wave functions.

For abstract, see NSA 29 05, number 12460.

JINR-P3-7519 PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Neutron Physics.
ELEMENTARY EXCITATION SPECTRUM AND BOSE-CONDENSATE IN SUPERFLUID HELIUM.
Zh. A. Kozlov, V. A. Parfenov, and B. Sidzhimov. 1973, 20p
In Russian. U.S. Sales Only.

Descriptors: (*Helium ii, *Neutron transport), Bose-einstein condensation, Energy transfer, Excitation, Scattering, Spectra, Superfluidity.

For abstract, see NSA 29 05, number 11317.

KFK-1860 PC$10.50/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Neutronenphysik und Reaktortechnik.
TURBULENT HEAT TRANSFER TO HELIUM AND HYDROGEN IN HEATED TUBES IN THE PRESENCE OF LARGE AXIALLY INCREASING TEMPERATURE DIFFERENCES AND THE RESULTING TEMPERATURE PROFILE.
H. J. Pfriem. Sep 73, 168p
In German. U.S. Sales Only.

Descriptors: (*Helium, *Heat transfer), (*Hydrogen, Heat transfer), Heating, Temperature distribution, Temperature gradients, Tubes.

For abstract, see NSA 29 05, number 10067.

N74-14975/8GA PC$3.00/MF$1.45
Laboratoire de Physique Theorique et des Hautes Energies, Orsay (France).
THE EQUATION OF STATE OF A SYSTEM OF HARD SPHEROCYLINDERS.
J. Vieillard-baron. Oct 73, 20p LPTHE-73/28

Descriptors: *Cylindrical bodies, *Equations of state, *Monte carlo method, Hemispherical shells, Spheroids.

For abstract, see STAR 1206

N74-15662/1GA PC$3.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
BASIC EXPERIMENTS IN TEMPERATURE REGULATION.
J. Aschoff. Jan 74, 14p NASA-TT-F-15226
Contract NASW-2481
Tran-Transl. Into English from Arch. Ges. Physiol. (Berlin), V. 247, 1944 p 470-479.

Descriptors: *Calorimeters, *Heat transfer, *Temperature control, Fluid flow, Heat transfer coefficients, Liquid cooling, Temperature measurement, Thermocouples.

For abstract, see STAR 1206

20N. Wave Propagation

AD-774 986/4GA PC$28.50/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
MEASUREMENT OF RADIOTHERMAL AND PLASMA RADIATIONS IN THE SUPERHIGH-FREQUENCY RANGE,
A. E. Basharinov, L. T. Tuchkov, B. M. Polyakov, and N. I. Ananov. 5 Mar 74, 428p Rept no. FSTC-HT-23-670-69
Trans. of mono. Izmerenie Radioteplovykh i Plazmennykh Izluchenii v SVCh Diapazone, Moscow, 1968 390p.

Descriptors: *Electromagnetic radiation, *Superhigh frequency, Blackbody radiation, Cerenkov radiation, Thermal radiation, Bremsstrahlung, Cyclotron resonance, Plasmas(Physics), Extraterrestrial radiation, Radiometry, Translations, USSR.
Identifiers: Atmospheric radiation, Terrestrial radiation.

This monograph gives a systematic presentation of the results of studies of the generation and transfer of natural superhigh-frequency radiations and the reception of superhigh-frequency broad-band signals in relation to the problem involved in propagation of radio waves, geophysics, radiometeorology and plasma physics. In addition to a generalization of the studies made by the authors and their associates, the monograph gives systematically processed material on the theoretical and experimental studies published prior to the middle of 1966. The monograph consists of four parts giving physical concepts concerning the mechanism of superhigh-frequency radiations, the results of studies of the superhigh-frequency radiation of different types of ground cover, the atmosphere and plasma formations, and considers the problems involved in signal reception and selection.

AD-775 063/1GA Reprint
California Univ San Diego La Jolla Inst for Pure and Applied Physical Sciences
THE IONOSPHERE AS THE SECONDARY CONDUCTOR OF A TRANSFORMER FOR ELF,
Henry G. Booker. 10 May 73, 6p
Contract DAHC04-72-C-0037
Presented at the French Section of the IEEE in Paris on Apr 72 and the URSI Meeting in Williamsburg, Va., on Dec 72.
Availability: Pub. in Radio Science, v8 n8-9 p757-762 Aug-Sep 73.

Descriptors: *Electromagnetic wave propagation, *Extremely low frequency, Ionospheric propagation, Power transformers.

A study is made of the physics of radiation into the guide between the earth and the ionosphere from a center-fed antenna consisting of a long horizontal wire grounded at its two ends.

AD-775 070/6GA PC$5.00/MF$1.45
Office of Telecommunications Boulder Colo Inst for Telecommunication Sciences
ELECTROMAGNETIC SCATTERING OF AN ARBITRARY PLANE WAVE BY TWO NON-INTERSECTING PERPENDICULAR WIRE GRIDS,
David A. Hill, and James R. Wait. 1 Nov 73, 36p
Rept no. Scientific-61 AFCRL-TR-73-0690
Contract PRO-Y-71-872

Descriptors: *Electromagnetic scattering, Plane waves, Wire, Grids, Perturbations, Mathematical analysis.

A doubly infinite set of linear equations is derived for the currents excited on the pair of planar wire grids by a plane wave of arbitrary polarization. The equations can be solved by perturbation if the two planar arrays are sufficiently separated or by truncation and matrix inversion otherwise. The transmission coefficients are derived including the cross-polarized components, and numerical results are presented to illustrate the effects of various parameters. (Author)

AD-775 235/5GA PC$3.00/MF$1.45
Bojarski (Norbert N.), Moorestown, N.J.
INVERSE SCATTERING.
Final rept.,
Norbert N. Bojarski. Feb 74, 20p
Contract N00019-73-C-0312
See also AD-910 661.

Descriptors: *Electromagnetic scattering, Dipole antennas, Computer graphics, Integral equations.
Identifiers: Inverse scattering.

The Physical Optics and Exact Inverse Scattering solutions of this author are summarized. For the Physical Optics Inverse Scattering Method, shown are computer-reconstructed images of a sphere and cylinder from computer synthetic scattering data, as well as a sphere from experimentally measured data. For the exact Inverse Scattering Method, shown are computer-reconstructed source distributions (currents) of a half wave dipole antenna, a point-source, and two point-sources separated by one-half-wavelength, from computed synthetic scattering data. (Author)

AD-775 344/5GA Reprint
New York Univ N Y Courant Inst of Mathematical Sciences
POWER STATISTICS FOR WAVE PROPAGATION IN ONE DIMENSION AND COMPARISON WITH RADIATIVE TRANSPORT THEORY,
W. Kohler, and G. C. Papanicolaou. 11 May 74, 14p
Contract N00014-67-A-0467-0015, Grant AF-AFOSR-20-13-71
Availability: Pub. in the Mathematical Physics, v14 n12 p1733-1745 Dec 73.

Descriptors: *Electromagnetic wave propagation, Transport properties, Transmission lines, Propagation.

The report considers a one-dimensional medium with random index of refraction or a transmission line with random capacitance per unit length, al-

lowing for impedance mismatch at the load and generator. The authors compute the expected value of the incident and reflected powers at any point between the generator and load in the limit of weak fluctuations and a long line. The results are compared with those of radiative transport theory and discrepancies show the limitations of that theory. The spreading of pulses due to random fluctuations is considered. (Modified author abstract)

AD-775 483/9GA PC$4.00/MF$1.45
Massachusetts Inst of Tech Lexington Lincoln Lab
TRANSVERSE ELECTRIC SCATTERING FROM LOADED STRIPS.
Final rept.,
Chalmers M. Butler, Donald R. Wilton, and Robert F. McKinney. 31 Jul 73, 72p Rept no. LL-2 ESD-TR-73-350
Contract F19628-73-C-0002
Prepared by Mississippi Univ., University. Dept. of Electrical Engineering.

Descriptors: *Electromagnetic scattering, Transverse, Electrical loads, Electrical impedance, Radar cross sections, Theory.

A theory is developed for the transverse electric analysis of two dimensional strips which are vanishingly thin and perfectly conducting, both with contiguous edge loading and with loaded strips separated from the perfectly conducting center strip. Integral equations for the above geometries and for thin rectangular cylinders are formulated and solved numerically for the currents on the bodies. The scattered fields and monostatic radar cross sections are calculated from the currents. Numerical data are presented as is a limited parameter study. (Author)

AD-775 426/0GA PC$3.75/MF$1.45
Stanford Research Inst Menlo Park Calif
SATELLITE-VIEWED CLOUD COVER AS A DESCRIPTOR OF TROPOSPHERIC RADIO-RADAR PROPAGATION CONDITIONS.
Final rept. 1 Jan 69-31 Dec 73,
Sidney M. Serebreny, and Roy H. Blackmer, Jr. Feb 74, 51p AROD-8242.1-GS
Contract DAHC04-69-C-0065
See also report dated Feb 71, N71-21414.

Descriptors: *Radio transmission, *Tropospheric scatter communications, *Cloud cover, Correlation techniques, Radiofrequency interference, Pacific Ocean, Europe.
Identifiers: Spaceborne photography.

Variations in the strength of received signal levels on tropospheric scatter radio-communication links were compared with atmospheric conditions along the propagation path as inferred from cloud cover photographed by meteorological satellites. The primary objective was to see whether changes in signal levels were related to satellite-viewed cloud cover. (Modified author abstract)

AD-775 472/4GA PC$7.00/MF$1.45
Georgia Inst of Tech Atlanta Engineering Experiment Station
STUDY OF COMPARATIVE COSTS FOR FAR-FIELD ANTENNA PATTERNS DETERMINED BY NEAR-FIELD MEASUREMENTS AND BY FAR-FIELD MEASUREMENTS.
Final rept. 15 Jan 73-31 Jan 74,
G. P. Rodrigue, and Charles P. Burns. Jan 74, 76p Rept no. GIT-A-1498
Contract DAAH01-73-C-0430

Descriptors: *Antenna radiation patterns, *Phased arrays, Near field, Far field, Cost analysis.

Antenna pattern measurement costs for both acceptance testing and production testing of a large phased array were determined for both near-field and far-field measurement techniques. Operating costs depend on the thoroughness to which the antenna is tested. Extremely large amounts of data can be generated very efficiently using the near-field technique. However, most test programs are limited by budget and time considerations to a relatively small volume of data. Since requirements for more data would always favor the near-field techniques, a limited set of measurements comparable to previous far-field measurement experience was used. (Modified author abstract)

AD-775 477/3GA PC$4.00/MF$1.45
Technische Hochschule Graz (Austria) Institut Fuer Theoretische Physik Und Reaktorphysik
WAVE PROPAGATION BETWEEN EARTH AND IONOSPHERE TAKING INTO ACCOUNT DIFFERENT REGIONS OF GROUND CONDUCTIVITY AND A VARIABLE HEIGHT OF THE IONOSPHERE.
Final technical rept. Jul 72-Oct 73,
Ernst Ledinegg. Dec 73, 100p
Contract DAJA37-72-C-3796

Descriptors: *Radio transmission, *Polar regions, Very low frequency, Geomagnetism, Sea water, Ice, Surface properties, Radiofrequency interference, Mathematical models, Austria.

The report contains results of a continuation of researches on VLF wave propagation between earth and ionosphere in the polar region where the path of the RF signal passes above both the sea and the ice of Greenland. The aim of this investigation is to find an explanation in terms of analytical solutions of phase and amplitude anomalies observed by F. REDER and S. WESTERLUND.

AD-775 518/4GA PC$9.00/MF$1.45
Wisconsin Univ Madison Geophysical and Polar Research Center
EXPERIMENT AND NUMERICAL EVALUATION OF ACOUSTIC SCATTERING AT A ROUGH SURFACE.
Research rept.,
Gerald A. Sandness. 2 Oct 73, 119p Rept nos. RR-73-2, Contrib-304
Contract N00014-67-A-0128-0009

Descriptors: *Acoustic scattering, *Electromagnetic scattering, *Surface roughness, Approximation(Mathematics), Numerical integration, Computer programs.
Identifiers: Helmholtz equation, SCATTER computer program, TRANSLATE computer program, PGEN2 computer program, PSIN1 computer program, PSIN2 computer program, PDF computer program.

The Helmholtz integral is often used as the basis for theories on scattering of acoustic signals from rough surfaces, but several approximations must be made to obtain analytical solutions. Many of the mathematical difficulties in analytical computations can be avoided by numerically evaluating the Helmholtz integral. A numerical technique is described which uses measured values of the acoustic pressure of the incident beam, including the side lobes, thereby removing the uncertainty which normally results from approximating the form of the incident beam. A comparison of numerical, analytical, and experimental results is made for the case of a vertically incident beam and a moderately rough surface. The numerical computations are shown to yield values of the scattered pressure which agree well with experimental data for both rough and smooth surfaces. (Modified author abstract)

21. PROPULSION AND FUELS

21B. Combustion and Ignition

AD-775 060/7GA PC$3.25/MF$1.45
United Aircraft Research Labs East Hartford Conn
DEVELOPMENT OF A COMBUSTOR FLOW ANALYSIS: PART II. EXPERIMENTAL STUDIES.
Final rept. 1 Jun-30 Sep 73,
Robert F. Anasoulis, and Henry McDonald. 28 Feb 74, 38p AFAPL-TR-73-98-Pt-2
Contract F33615-72-C-2042

Descriptors: *Combustion chambers, *Gas turbines, *Exhaust gases, Temperature, Gas analysis, Profiles, Position(Location).

Measurements were conducted in a full annular premixed combustor to provide profiles of UHC, CO, CO2, O2, N2, H2, NO, NOx and temperature at various axial locations. The work was performed to further develop an existing computational procedure for predicting the performance and exhaust emission characteristics of can-annular or annular gas turbine combustors. The results, however, were also found to be useful in showing areas within the combustor where emissions, particularly NOx, are formed. (Modified author abstract)

AD-775 112/6GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
STABILITY OF DIFFUSION BURNING OF GAS AFTER THE STABILIZERS,
V. A. Khristich, and G. N. Lyubchik. 4 Feb 74, 9p Rept no. FTD-HT-23-875-74
Edited trans. of Teoriya i Praktika Szhiganiya Gaza (USSR) v5 p82-85 1972, by K. L. Dion.

Descriptors: *Combustion stability, Diffusion, Homogeneity, USSR, Translations.
Identifiers: *Diffusion flames.

AD-775 114/2GA PC$4.25/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
THE STATE-OF-THE-ART AND CERTAIN PROBLEMS IN THE THEORY OF COMBUSTION OF CONDENSED SYSTEMS,
A. D. Margolin. 1 Feb 74, 21p Rept no. FTD-MT-24-572-74
Edited machine trans. of mono. Gorenie i Vzryv, Moscow, 1972 p5-14, by Dean F. W. Koolbeck.

Descriptors: *Combustion, *Burning rate, Rates, Combustion stability, Oxidizers, Heterogeneity, Homogeneity, Erosive burning, USSR, Translations.

The survey presents brief consideration of questions in the theory of the rate of combustion of homogeneous, heterogeneous, liquid, and two-phase systems which burn because of an internal oxidizer, along with questions of stability and regulation of combustion.

AD-775 178/7GA Reprint
California Univ Berkeley Coll of Engineering
PRESSURE WAVES GENERATED BY STEADY FLAMES.
Interim rept.,
A. K. Oppenheim, A. L. Kuhl, and M. M. Kamel. 1973, 18p AFOSR-TR-74-0213
Grant AF-AFOSR-2200-72
Availability: Pub. in the Proceedings of the International Symposium on Combustion (14th) University Park, Pa., 20-25 Aug. 72, p1201-1215 1973.

Descriptors: *Flames, *Shock waves, Blast, Flow fields, Gas dynamics, Pressure, Waves.

The report is concerned primarily with the analysis of pressure waves that can be generated by clouds of explosive gas mixtures in a free atmosphere which is initially at a uniform state. Since maximum effects are of prime interest, ignition and initial flame acceleration are considered to be out of scope, and the treatment is restricted only to the final state of constant flame velocity when the flow field is self-similar. By the introduction of

reduced blast-wave parameters as phase-plane coordinates, the problem is resolved into the determination of the appropriate integral curves on this plane. (Modified author abstract)

AD-775 289/2GA PC$3.25/MF$1.45
Naval Weapons Center China Lake Calif
APPLICATION OF COMBUSTION INSTABILITY RESEARCH.
Technical publication,
E. W. Price. Jan 74, 26p Rept no. NWC-TP-5603

Descriptors: *Rocket engines, *Combustion stability, Solid propellant rocket engines, Rocket propulsion, Management planning and control, Rocket research, Combustion, Oscillation.
Identifiers: *Combustion instability.

Combustion instability is described in both technical terms and in terms of problems posed in development programs and what constitutes solution of the problems. The nature of research results and impediments to application are described (both technical and administrative impediments). Successful applications of research are described, applications ranging from advance recognition of high risk situations to problem diagnosis, fix and quality control in development and production motors. Finally, problems and recommendations regarding future research and application are described, including both technical and management (system planning) aspects of the problem. (Author)

AD-775 386/6GA PC$4.00/MF$1.45
United Aircraft Research Labs East Hartford Conn
DEVELOPMENT OF A COMBUSTOR FLOW ANALYSIS. PART III. USER'S MANUAL FOR THE FIELD RELAXATION ELLIPTIC PROCEDURE.
Final rept. (Part 3),
R. F. Anasoulis. 18 Feb 74, 85p Rept no. UARL-M911449-16 AFAPL-TR-73-98-Pt-3
Contract F33615-72-C-2042
See also Part 2, AD-775 060.

Descriptors: *Combustion chambers, Combustion, Finite difference theory, Turbulence, Drops, Gas flow, Computerized simulation, Computer programming, FORTRAN.
Identifiers: *Combustors, FORTRAN 5 programming language.

A finite-difference procedure for computing the flow within two-dimensional or axisymmetric combustion chambers is described. Different geometries and boundary conditions can be treated as well as alternate hydrocarbon fuels and oxidizers. Refinements to the chemistry, turbulence, or droplet flow modeling is easily implemented within the framework of the procedure. Noncombusting flow problems can also be treated by simple changes to the input data. The numerical code has been programmed in FORTRAN V and is designated F865. (Modified author abstract)

N74-15658/9GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
FILM COOLING IN A COMBUSTOR OPERATING AT FUEL-RICH EXIT CONDITIONS.
R. R. Tacina, and C. J. Marek. Jan 74, 35p NASA-TN-D-7513, E-7561

Descriptors: *Combustion chambers, *Film cooling, Flow velocity, Fuel combustion, Fuel-air ratio, Heat transfer.

For abstract, see STAR 1206

21C. Electric Propulsion

N74-15462/6GA PC$19.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SERT C PROJECT STUDY.
Jan 74, 338p NASA-TM-X-71508

Descriptors: *Ion engines, *Project planning, *Space electric rocket tests, Low cost, Solar electric propulsion, Spacecraft design, Stationkeeping, Technology assessment.

For abstract, see STAR 1206

N74-15546/6GA PC$13.75/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SERT D SPACECRAFT STUDY.
1974, 233p NASA-TM-X-71494

Descriptors: *Ion engines, *Project planning, *Space electric rocket tests, Attitude control, Low cost, Orbital rendezvous, Solar arrays, Stationkeeping, Synchronous satellites.

For abstract, see STAR 1206

N74-15547/4GA PC$4.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
TADPOLE SATELLITE.
Jan 74, 36p NASA-TM-X-71498, E-7861

Descriptors: *Ion engines, *Low cost, *Synchronous satellites, Attitude control, Project planning, Reaction wheels, Stationkeeping.

For abstract, see STAR 1206

21D. Fuels

AD-774 824/7GA PC$3.25/MF$1.45
Coating and Chemical Lab Aberdeen Proving Ground Md
FIRE-SAFE FUEL: FUEL PROPERTIES AND SYSTEM COMPATIBILITY STUDIES.
Interim rept.,
Maurice E. Le Pera, and John G. Sonnenburg. Feb 74, 26p Rept no. CCL-3012

Descriptors: *Diesel fuels, *Fire extinguishing agents, *Halogenated hydrocarbons, Corrosion, Compatibility, Additives, Armored vehicles, Elastomers, Dielectric properties, Surface properties.
Identifiers: Methane/bromochloro.

In conjunction with the coordinated Fire-Safe Fuel (FSF) Program, a study was conducted to assess the effects of the FSF additive (5% vol. Bromochloromethane) on diesel fuel performance criteria, elastomer compatibility, and potential system corrosion tendencies. Laboratory techniques were employed to define those changes in basic fuel properties/characteristics resulting by additions of the Bromochloromethane. In addition, accelerated tests revealed potential elastomer-fuel incompatibility and corrosion problems occurring from the possible use of FSF. (Author)

AD-775 005/2GA PC$3.75/MF$1.45
National Academy of Sciences Washington D C
LNG: WATER EXPLOSIONS.
Final rept.,
D. L. Katz. Mar 73, 63p* USCG-D-60-74
Contract DOT-CG-11775

Descriptors: *Liquefied natural gas, *Explosions, *Marine transportation, Petroleum products, Tankers, Hazards, Heat transfer, Ignition, Safety, Coast Guard.

The report directs attention to a proposed solution of a puzzling problem that has been a cause of concern in the shipment of liquefied natural gas--a type of flameless explosion encountered under certain conditions when liquefied natural gas is spilled into water. The report suggests further research to improve understanding of the phenomenon.

AD-775 176/1GA Not available NTIS
California Univ Berkeley Dept of Mechanical Engineering
THE HYDROGEN FUEL ECONOMY AND AIRCRAFT PROPULSION.
Interim rept.,
Arthur L. Austin, and Robert F. Sawyer. Nov 73, 7p AFOSR-TR-74-0243
Contract AF-AFOSR-2299-72
Pub. in the AIAA/SAE Propulsion Conference(9th), Las Vegas, Nev., 5-7 Nov 73. Paper 73-1319.
Availability: Available from AIAA, 1290 Ave. of Americas, New York, N.Y. 10019. PC$2.00/MF$1.00.

Descriptors: *Aircraft, *Propulsion systems, Aviation fuels, Hydrogen, Economics.

Transportation currently is almost completely dependent upon liquid petroleum derived fuels. Hydrogen is a clean, attractive alternative fuel for aircraft propulsion. Large, new sources of economical hydrogen are required before hydrogen can play an important role as an aircraft fuel. Hydrogen cannot produce a significant impact on fuel availability for aircraft until well after 1990. (Author)

AD-775 464/1GA PC$3.00/MF$1.45
Army Land Warfare Lab Aberdeen Proving Ground Md
IMPROVED LWL FUEL TABLET.
Final rept. 5 Oct 71-2 Oct 72,
Frederick M. Drake. Dec 73, 14p* Rept no. LWL-TR-74-05

Descriptors: *Acetal resins, *Solid fuels, Ignition, Combustion, Pellets.
Identifiers: Performance evaluation.

The report briefly describes development and performance of a solid fuel tablet for field use. It is made from an acetal resin called Delrin by polymerization of formaldehyde.

21E. Jet and Gas Turbine Engines

AD-775 094/6GA PC$3.00/MF$1.45
California Univ Berkeley Dept of Mechanical Engineering
FACTORS CONTROLLING POLLUTANT EMISSIONS FROM GAS TURBINE ENGINES,
Robert F. Sawyer, Nicholas P. Cernansky, and Antoni K. Oppenheim. 1974, 15p AFOSR-TR-74-0192
Grants AF-AFOSR-2299-72, AF-AFOSR-2200-72

Descriptors: *Gas turbines, *Air pollution, Smoke, Aldehydes, Hydrocarbons, Combustion, Exhaust gases, Aircraft engines, Carbon monoxide, Particulates, Nitrogen oxides, Operation.

Primary pollutants emitted by aircraft gas turbine engines are carbon monoxide, hydrocarbons, aldehydes, smoke, particulates, and nitric oxide. Factors controlling emissions of these pollutants are analyzed on the basis of aircraft engine exhaust composition and laboratory studies of gas turbine combustion processes. Moreover, an analytical prediction of the effect of aircraft operating parameters on the emission of nitric oxide is also given. Operational conditions and engine parameters such as ambient temperature, pressure, and humidity, flight altitude, flight Mach number, water injection, fuel properties, and combustor characteristics have been studied analytically, yielding rational criteria for the prediction of their effect on the emission of nitric oxide. (Modified author abstract)

AD-775 337/9GA PC$3.75/MF$1.45
United Aircraft Research Labs East Hartford Conn
DEVELOPMENT OF OPTIMAL CONTROL MODES FOR ADVANCED TECHNOLOGY PROPULSION SYSTEMS.
Annual technical rept. 1 Feb 73-31 Jan 74,

Gerald J. Michael, and Florence A. Farrar. Mar 74, 60p Rept no. UARL-N911620-2
Contract N00014-73-C-0281
See also AD-767 425.

Descriptors: *Turbofan engines, *Adaptive control systems, Short takeoff aircraft, Control, Feedback, Hovering, Turbine parts, Fuel meters, Inlets, Thrust control.
Identifiers: F-401 engines.

A nonlinear multivariable feedback controller was defined for the idle to military operating regime (9 to 100 percent thrust) of the Pratt and Whitney Aircraft F401 variable cycle turbofan engine. The analytical design involved linearizing the F401 engine dynamics about five steady-state operating points between idle and military thrust, applying linear optimal control synthesis methods at each point, and combining the five optimal linear controllers into a single nonlinear controller which has feedback gains that are scheduled with high compressor speed. Variable fan, compressor and exhaust geometries as well as main burner fuel flow are coordinated by the controller to achieve rapid engine dynamic response. (Modified author abstract)

AD-775 453/4GA PC$3.75/MF$1.45
Boeing Co Wichita Kans Wichita Div
FAA JT3D QUIET NACELLE RETROFIT FEASIBILITY PROGRAM. VOLUME I-1. LOWER GOAL DESIGN, FABRICATION, AND GROUND TESTING.
Final rept. Jul 71-Feb 73,
J. E. Mayer. Jun 73, 56p Rept no. D3-9042-1 FAA-RD-73-131-I-1
Contract DOT-FA71WA-2628

Descriptors: *Jet engine nacelles, *Noise reduction, Experimental design, Turbojet engines, Jet engine noise, Acoustics, Fabrication, Captive tests.
Identifiers: JT3D engines, Boeing 707 aircraft, *Retrofit, Quiet nacelles, Engine cowlings.

The work accomplished in Phase 1 of this contract included design, fabrication, and ground testing of a flightworthy quiet nacelle which satisfied the FAA lower goal for noise reduction of JT3D powered 707 aircraft. The quiet nacelle configuration consisted of a two-ring acoustically treated inlet, new fan thrust reverser, 3/4 length acoustically treated fan ducts, and revised contour aft translating sleeve. The configuration retained the standard primary thrust reverser and engine tailpipe. The quiet nacelle was ground tested to determine acoustic and performance data. Production JT3D nacelles were similarly tested thus providing a baseline whereby comparisons of acoustic and propulsion performance could be made. (Modified author abstract)

N74-15456/8GA PC$3.00/MF$1.45
National Aeronautical Lab., Bangalore (India).
INVESTIGATION OF THE DYNAMIC STRENGTH OF BLADING OF HIGH PRESSURE TURBINES IN THE GAS TURBINE UNIT (AT KALUGA TURBINE PLANT).
L. I. Ostrovskii, and D. A. Arkadev. Jul 72, 20p
NAL-TR-119
Tran-Transl. Into English from Energomashinostr. (Ussr), No. 12, 1970 p 34-36.

Descriptors: *Mechanical properties, *Turbine blades, *Vibrational stress, Dynamic stability, Gas turbines, Metal fatigue, Thermal stresses.

For abstract, see STAR 1206

N74-15457/6GA PC$3.00/MF$1.45
National Aeronautical Lab., Bangalore (India).
EXPERIMENTAL DETERMINATION OF FREQUENCIES AND MODES OF VIBRATIONS IN TURBINE BLADES.
A. P. Yakoviev, and G. C. Pisarenko. Sep 73, 14p
NAL-TR-185
Tran-Transl. Into English from the Publ. "Russeyaniya Energii Pri Kolebaniyakh Uprugikh Sistem" Kiev, Tekh., 1962 p 170-176.

Descriptors: *Turbine blades, *Vibration mode, *Vibration tests, *Vibrational spectra, Resonant frequencies, Structural vibration, Turbomachinery, Vibrational stress.

For abstract, see STAR 1206

N74-15458/4GA PC$3.00/MF$1.45
National Aeronautical Lab., Bangalore (India).
DESIGNING TURBOMACHINE BLADES FOR FORCED VIBRATIONS UNDER VARIOUS EXCITATION CONDITION.
U. S. Vorobiev, and N. G. Medvedev. Sep 73, 16p
NAL-TR-186
Tran-Transl. Into English from Probl. Prochnosti V Mashinostr., Akad. Nauk Sssr, Inst. Mashinoved. (Moscow), V. 4, Nov. 1972 p 15-19.

Descriptors: *Structural design criteria, *Turbine blades, *Vibrational stress, Dynamic stability, Gas turbines, Mechanical properties, Metal fatigue, Stress analysis.

For abstract, see STAR 1206

N74-15460/0GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
THRUST PERFORMANCE OF ISOLATED PLUG NOZZLES WITH TWO TYPES OF 40-SPOKE NOISE SUPPRESSOR AT MACH NUMBERS FROM 0 TO 0.45.
D. E. Harrington, and J. J. Schloemer. Jan 74, 37p NASA-TM-X-2951, E-7541

Descriptors: *Noise reduction, *Plug nozzles, *Supersonic wind tunnels, *Thrust measurement, Jet aircraft noise, Performance tests, Turbojet engines.

For abstract, see STAR 1206

N74-15464/2GA PC$3.50/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
FORTRAN PROGRAM TO GENERATE ENGINE INLET FLOW CONTOUR MAPS AND DISTORTION PARAMETERS.
J. H. Dicus. Feb 74, 63p NASA-TM-X-2967, E-7572

Descriptors: *Computer programs, *Engine inlets, *Flow distortion, Contours, Flow distribution, Fortran, Jet engines, Mapping.

For abstract, see STAR 1206

N74-15465/9GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
FLIGHT VELOCITY EFFECTS ON JET NOISE OF SEVERAL VARIATIONS OF A 48-TUBE SUPPRESSOR INSTALLED ON A PLUG NOZZLE.
R. R. Burley, and V. L. Head. Feb 74, 38p NASA-TM-X-2919, E-7513

Descriptors: *Airspeed, *Noise reduction, *Plug nozzles, F-106 aircraft, Flight tests, Jet aircraft noise, Static tests, Suppressors.

For abstract, see STAR 1206

N74-15466/7GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
FLIGHT VELOCITY EFFECTS ON JET NOISE OF SEVERAL VARIATIONS OF A TWELVE-CHUTE SUPPRESSOR INSTALLED ON A PLUG NOZZLE.
R. R. Burley, and A. L. Johns. Feb 74, 38p NASA-TM-X-2918, E-7449

Descriptors: *Airspeed, *Jet aircraft noise, *Noise reduction, *Plug nozzles, F-106 aircraft, Flight tests, Propulsion system configurations, Static tests, Suppressors.

For abstract, see STAR 1206

PATENT-3 747 875 Not available NTIS
Department of the Air Force Washington D C
V/STOL AIRCRAFT-BY-PASS ENGINE HAVING A DOUBLE, THRUST DIVERTER VALVE ASSEMBLY.
Patent,
Emerson W. Stevens. Filed 4 Nov 71, patented 24 Jul 73, 7p Rept nos. PAT-APPL-195 601,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Jet engines, *Bypass valves, *Patents, Short takeoff aircraft, Turbofan engines, Thrust control, Cascade structures.
Identifiers: PAT-CL-244-53-R, *Bypass engines.

The invention relates generally to the application of the by-pass or turbofan engine to VTOL and/or V/STOL aircraft and, in particular, to an improved thrust diverter valve assembly therefor.

21F. Nuclear Propulsion

PATENT-3 780 827 Not available NTIS
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
GAS TURBINE EXHAUST NOZZLE.
Patent.
D. M. Straight. Patented 25 Dec 73, 6p NASA-CASE-LEW-11569-1,
Misc-Filed 19 Dec. 1972 Supersedes N73-14792 (11 - 05, p 0590).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Exhaust gases, *Gas turbines, *Noise reduction, Afterburning, Combustion chambers, Nozzle flow, *Patents.

An elongated hollow string is disposed in an exhaust nozzle combustion chamber and communicates with an air source through hollow struts at one end. The other end of the string is bell-mouth shaped and extends over the front portion of a nozzle plug. The bell-mouth may be formed by pivotally mounted flaps or leaves which are used to vary the exhaust throat area and the area between the plug and the leaves. Air from the engine inlet flows into the string and also between the combustion chamber and a housing disposed around the chamber. The air cools the plug and serves as a low velocity inner core of secondary gas to provide noise reduction for the primary exhaust gas while the other air, when it exits from the nozzle, forms an outer low velocity layer to further reduce noise. The structure produces increased thrust in a turbojet or turbofan engine.

21G. Reciprocating Engines

AD-775 023/8GA PC$7.25/MF$1.45
Naval Postgraduate School Monterey Calif
DYNAMIC AND FLUID DYNAMIC CHARACTERISTICS OF A FUEL INJECTION NOZZLE.
Master's thesis,
Gordon McGlohon Nichols, Jr. Dec 73, 84p

Descriptors: *Fuel injection, *Fuel injectors, *Fuel nozzles, Internal combustion engines, Fuel sprays, Fuel systems, Dynamic response, Fluid dynamics, Gasoline, Theses.

Due to the increasing requirements for reduced emissions from internal combustion engines many manufacturers have expressed interest in gasoline fuel injection systems. In order to determine the fluid dynamic and dynamic characteristics of a

commercial injector a test chamber was constructed and a laboratory simulation carried out. A proposed method of predicting flow rates and dynamic response has been compared with experimental results. (Author)

21H. Rocket Motors and Engines

N74-15455/0GA PC$4.00/MF$1.45
National Research Council of Canada, Ottawa (Ontario). Div. of Mechanical Engineering.
INVESTIGATION OF A SMALL HYDROGEN-OXYGEN ROCKET ENGINE.
R. Sandri, R. Billingham, and F. Chellingworth.
Aug 73, 37p NRC-13556, MP-64

Descriptors: *Engine design, *Hydrogen oxygen engines, Combustion chambers, Cooling systems, Heat transfer, Rocket engines.

For abstract, see STAR 1206

N74-15459/2GA PC$6.25/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
SOLID MOTOR DIAGNOSTIC INSTRUMENTATION.
Y. Nakamura, W. E. Arens, and W. S. Wuest. 1 Dec 73, 83p NASA-CR-136561, JPL-TM-33-656
Contract NAS7-100

Descriptors: *Engine monitoring instruments, *Solid propellant rocket engines, Engine failure, Failure analysis, Flight instruments, In-flight monitoring, Launch vehicles, Propulsion system performance, Real time operation.

For abstract, see STAR 1206

N74-15461/8GA PC$22.50/MF$1.45
Pratt and Whitney Aircraft, West Palm Beach, Fla. Research and Development Center.
ADVANCED SPACE ENGINE PRELIMINARY DESIGN.
Final Report.
J. P. B. Cuffe, and R. E. Bradie. Dec 73, 410p
NASA-CR-121237, PWA-FR-5654
Contract NAS3-16750

Descriptors: *Engine design, *Hydrogen oxygen engines, Costs, Equipment specifications, Flight optimization, Spacecraft propulsion.

For abstract, see STAR 1206

PAT-APPL-301 029 PC$3.00/MF$1.45
Department of the Air Force Washington D C
LIQUID EXPULSION SUBSYSTEM.
Patent Application,
H. Barbara. Filed 26 Oct 72, 10p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Expulsion bladders, Patents, Monopropellants, Propellant tanks, Feeding.
Identifiers: PAT-CL-137-38, *Patent applications.

The patent application relates to a liquid rocket propellant expulsion assembly for propellant tank control.

PATENT-3 762 644 Not available NTIS
Department of the Air Force Washington D C
STRESS RELIEF GROOVES FOR PYROLYTIC GRAPHITE COATED ROCKET NOZZLE INSERTS.
Patent,
Alan J. Mikeska. Filed 11 May 70, patented 2 Oct 73, 5p Rept nos. PAT-APPL-48 763,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Nozzle inserts, *Patents, Rocket nozzles, Pyrolytic graphite, Substrates, Stress relieving.
Identifiers: PAT-CL-239-265-11.

The patent relates to a method of preventing delamination of rocket nozzle insert coatings. The method entails the forming of stress relief grooves on the substrate material.

21I. Rocket Propellants

AD-774 904/7GA PC$11.75/MF$1.45
Aerojet Solid Propulsion Co Sacramento Calif
THE SELECTION AND DEMONSTRATION OF ADVANCED NONDESTRUCTIVE TESTING TECHNIQUES FOR ON-SITE MISSILE INSPECTION. VOLUME I. TECHNICAL REPORT.
Final rept. 15 May 72-14 Sep 73,
H. P. Briar, K. W. Bills, Jr., R. W. Cribbs, and B. L. Lamb. Nov 73, 172p Rept no. ASPC-1963-26F-Vol-1 AFRPL-TR-73-91-Vol-1
Contract F04611-72-C-0071
Prepared in cooperation with Electra-Physics Co., Folsom, Calif. See also Volume 2, AD-774 905.

Descriptors: *Guided missile silos, *Surface to surface missiles, *Solid rocket propellants, *Nondestructive testing, Solid propellant rocket engines, Ultrasonic tests, Holography, Radiography, Gamma rays, Profiles.
Identifiers: Acoustic profilography.

The program was planned around the problem of on-site non-destructive testing (NDT) of solid rocket motors. It was designed to select, evaluate, and demonstrate NDT capabilities, beginning with comprehensive surveys of industry and the world's literature (from 1960 to mid-1972). Many materials and NDT devices were identified; most of these being ruled out by the constraints of in-silo testing. Only two techniques showed promise: Ultrasonic holography and gamma radiography. (Modified author abstract)

AD-774 905/4GA PC$11.50/MF$1.45
Aerojet Solid Propulsion Co Sacramento Calif
THE SELECTION AND DEMONSTRATION OF ADVANCED NONDESTRUCTIVE TESTING TECHNIQUES FOR ON-SITE MISSILE INSPECTION. VOLUME II. APPENDICES.
Final rept. 15 May 72-14 Sep 73,
H. P. Briar, K. W. Bills, Jr., R. W. Cribbs, and B. L. Lamb. Nov 73, 168p Rept no. ASPC-1963-26F-Vol-2 AFRPL-TR-73-91-Vol-2
Contract F04611-72-C-0071
Prepared in cooperation with Electra-Physics Co., Folsom, Calif. See also Volume 1, AD-774 904.

Descriptors: *Guided missile silos, *Surface to surface missiles, *Solid rocket propellants, *Nondestructive testing, Solid propellant rocket engines, Ultrasonic tests, Holography, Radiography, Gamma rays, Profiles.
Identifiers: Acoustic profilography.

The report describes a program planned around the problem of on-site non-destructive testing (NDT) of solid rocket motors. It was designed to select, evaluate, and demonstrate NDT capabilities, beginning with comprehensive surveys of industry and the world's literature (from 1960 to mid-1972). Only two techniques showed promise: Ultrasonic holography and gamma radiography. In the ensuing developments ASPC evaluated two ultrasonic systems. The first, modified ultrasonic holography, was developed from known principals of holography and ultrasound transmission through materials. The theoretical resolution of this system ranges between 0.4 in. and 1 in. at a depth of 18 in. into the propellant. The second system, acoustic profilography, uses the principal of diffraction to measure the shortest path across a secant of the motor. (Modified author abstract)

AD-775 026/8GA PC$5.00/MF$1.45
Naval Postgraduate School Monterey Calif
APPLICATION OF LASER SCHLIEREN AND MONOCHROMATIC PHOTOGRAPHY TO SOLID PROPELLANT COMBUSTION RESEARCH.
Master's thesis,
Owen Allen Klahr. Dec 73, 37p

Descriptors: *Composite propellants, *Solid rocket propellants, *Combustion, Ammonium perchlorate, Solid rocket oxidizers, Photography, Lasers, Theses.

Ammonium perchlorate (AP)-binder sandwiches and a composite propellant were burned in a combustion bomb at various pressures. A schlieren system equipped with an argon laser was used to study the flame structure. High speed monochromatic motion pictures of solid propellant were taken during combustion, and ammonium perchlorate-binder interactions were investigated. The monochromatic pictures demonstrated that propellants without opacifiers cannot be effectively examined for surface interactions during combustion when using high intensity laser light. (Modified author abstract)

AD-775 041/7GA PC$5.25/MF$1.45
Naval Postgraduate School Monterey Calif
EVALUATION OF THE FRACTURE POSTULATE FOR VISCOELASTIC MATERIALS.
Master's thesis,
Robert Edwin Kapernick. Dec 73, 41p

Descriptors: *Fracture(Mechanics), *Solid rocket propellants, *Polymers, Viscoelasticity, Crack propagation, Stresses, Theses.
Identifiers: Polybutadiene.

Experimental studies were conducted on unfilled viscoelastic materials such as a carboxy terminated polybutadiene to evaluate the fracture postulate which states that crack velocity is a unique function of stress intensity factor. To do this, fracture characterization tests were conducted for constant load, constant displacement, and constant displacement rate histories. A cyclic study, a more sophisticated application of the constant displacement rate case, was also conducted as a further evaluation of the fracture postulate. The analytical theory used in obtaining viscoelastic stress intensity factors was based upon linear theory and sharp crack geometries. Moderate correlation was obtained among all test cases, notwithstanding the presence of significant specimen strains and finite crack tip radii. (Author)

AD-775 346/0GA PC$10.25/MF$1.45
Atlantic Research Corp Alexandria Va
DEVELOPMENT AND EVALUATION OF PG/SIC CODEPOSITED COATINGS FOR ROCKET NOZZLE INSERTS. VOLUME I. INSERT TEST AND EVALUATION IN HIGH PERFORMANCE PROPELLANT ENVIRONMENTS.
Final rept. Apr 72-Aug 73,
Cedric Bielawski, Kenneth E. Undercoffer, and Richard H. Singleton. Feb 74, 141p Rept nos. 46-5544-I-2/4, 46-5544-II-1/2 AFRPL-TR-73-107-Vol-1
Contract F04611-72-C-0047
See also Volume 2, AD-775 347.

Descriptors: *Solid propellant rocket engines, *Rocket nozzles, *Nozzle inserts, *Coatings, Silicon carbides, Pyrolytic graphite, Erosive burning, Captive tests, Vapor deposition.
Identifiers: HIPPO missiles.

Seven 1.7-inch throat diameter rocket nozzles were test fired in the HIPPO high pressure facilities at Edwards Air Force Base using three different solid propellants. Three 1.0-inch and two 2.0-inch throat diameter rocket nozzles were test fired at Atlantic Research Corporation using three different gel propellants. All of the throat inserts and most of the entrance sections were coated with PG/SiC. The erosion rates of all of the coated inserts tested in this program are plotted in Figures 49 and 50 as functions of pressure with temperature and level of gas oxidizing species indicated.

No delaminations occurred. Some cracking of the inserts occurred but this did not interfere with the attainment of erosion data. (Modified author abstract)

AD-775 347/8GA PC$22.50/MF$1.45
Atlantic Research Corp Alexandria Va
DEVELOPMENT AND EVALUATION OF PG/SIC CODEPOSITED COATINGS FOR ROCKET NOZZLE INSERTS. VOLUME II. THERMOSTRUCTURAL ANALYSES OF SELECTED NOZZLE TEST FIRINGS.
Final rept. Apr 72-Aug 73,
James W. Murray, Jeffrey R. Vaughan, and Carl W. Anderson, Jr. Feb 74, 387p Rept no. 46-5544-11-3/4 AFRPL-TR-73-107-Vol-2
Contract F04611-72-C-0047
See also Volume 1, AD-775 346.

Descriptors: *Solid propellant rocket engines, *Rocket nozzles, *Nozzle inserts, *Coatings, Silicon carbides, Pyrolytic graphite, Erosive burning, Captive tests, Vapor deposition.
Identifiers: HIPPO missiles.

Phase 2-Tasks 3 and 4 - Non-linear (elastic-plastic) thermostructural analyses were performed for seven PG/SiC codeposited inserts subjected to actual solid rocket test environments. A failure criteria for multiaxial stress fields and orthotropic material strengths was identified and used to predict failure of success of the inserts. A comparison of analytical predictions and actual test results in good correlation. Hence, a baseline was established from which a rational approach to designing codeposited inserts can be developed in the future. (Author)

N74-15625/8GA PC$14.00/MF$1.45
Southwest Research Inst., San Antonio, Tex.
ASSEMBLY AND ANALYSIS OF FRAGMENTATION DATA FOR LIQUID PROPELLANT VESSELS.
W. E. Baker, V. B. Parr, R. L. Bessey, and P. A. Cox. Jan 74, 236p NASA-CR-134538
Contract NAS3-16009

Descriptors: *Fragmentation, *Liquid rocket propellants, Blast loads, Chemical explosions, Debris, Fragments, Range safety, Terminal ballistics.

For abstract, see STAR 1206

22. SPACE TECHNOLOGY

22A. Astronautics

N74-14753/9GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Flight Research Center, Edwards, Calif.
HFL-10 LIFTING BODY FLIGHT CONTROL SYSTEM CHARACTERISTICS AND OPERATIONAL EXPERIENCE.
W. D. Painter, and G. J. Sitterle. Jan 74, 35p NASA-TM-X-2956, H-704

Descriptors: *Flight control, *Flight tests, *HI-10 reentry vehicle, *Hydraulic equipment, *Transonic speed, Aerodynamic characteristics, Electronic filters, Feedback control, Stabilization, Systems engineering.

For abstract, see STAR 1206

N74-14962/6GA PC$2.75/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
GAS FLOW ANALYSIS DURING THERMAL VACUUM TEST OF A SPACECRAFT.
J. J. Scialdone. Jan 74, 22p NASA-TN-D-7492, G-7346

Descriptors: *Gas analysis, *Outgassing, *Spacecraft contamination, *Vacuum tests, Fluid dynamics, Gas flow, Imp, Molecular flow, Reaction kinetics, Self absorption.

For abstract, see STAR 1206

N74-15504/5GA PC$4.75/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SYSTEM DEFINITION FOR COMETARY EXPLORER: A MISSION TO INTERCEPT THE COMETS GRIGG-SKJELLERUP (1977) AND GIACOBINI-ZINNER (1979).
Nov 73, 51p NASA-TM-X-70561, X-701-73-376

Descriptors: *Interception, *Mission planning, Ballistics, Comets, Space probes.

For abstract, see STAR 1206

N74-15507/8GA PC$6.25/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
THE OCTOBER 1973 NASA MISSION MODEL ANALYSIS AND ECONOMIC ASSESSMENT.
Jan 74, 84p NASA-TM-X-64798

Descriptors: *Economic analysis, *Operations research, *Spacecraft models, Mission planning, Nasa programs, Payloads, Space shuttles, Spacelab.

For abstract, see STAR 1206

N74-15508/6GA PC$3.00/MF$1.45
Techtran Corp., Glen Burnie, Md.
ON THE THRESHOLD OF THE JOINT FLIGHT.
N. N. Gurovskiy, O. Z. Gazenko, B. B. Yegorov, and N. Zykov. Jan 74, 12p NASA-TT-F-15269
Contract NASW-2485
Tran-Transl. Into English from Nauka I Zhizn (Moscow), No. 10, Oct. 1973.

Descriptors: *International cooperation, *Space flight, *U.s.s.r. space program, Exobiology, Hygiene, Languages, Space flight training, United states of america.

For abstract, see STAR 1206

N74-15517/7GA PC$15.50/MF$1.45
Carnegie-Mellon Univ., Pittsburgh, Pa. Applied Space Sciences Program.
ATTITUDE DYNAMIC OF SPIN-STABILIZED SATELLITES WITH FLEXIBLE APPENDAGES.
Final Report.
M. L. Renard. Sep 73, 266p NASA-CR-132902
Contract NGR-39-087-026

Descriptors: *Flexible bodies, *Satellite attitude control, *Spacecraft stability, *Spin stabilization, Computer programming, Dynamic stability, Equations of motion.

For abstract, see STAR 1206

N74-15518/5GA PC$6.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE SPACE SHUTTLE PAYLOAD PLANNING WORKING GROUPS. VOLUME 1: ASTRONOMY.
Final Report.
May 73, 80p NASA-TM-X-69409

Descriptors: *Mission planning, *Space shuttles, *Spaceborne astronomy, *Spaceborne telescopes, Equipment specifications, Large space telescope, Payloads, Research projects, Spacecraft components, Systems engineering.

For abstract, see STAR 1206

N74-15519/3GA PC$6.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE SPACE SHUTTLE PAYLOAD PLANNING WORKING GROUPS. VOLUME 2: ATMOSPHERIC AND SPACE PHYSICS.
Final Report.
May 73, 79p NASA-TM-X-69408

Descriptors: *Atmospheric physics, *Mission planning, *Space laboratories, *Space missions, *Space shuttles, Data acquisition, Data processing, Equipment specifications, Payloads, Research projects, Test equipment.

For abstract, see STAR 1206

N74-15520/1GA PC$7.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE SPACE SHUTTLE PAYLOAD PLANNING WORKING GROUPS. VOLUME 3: HIGH ENERGY ASTROPHYSICS.
Final Report.
May 73, 97p NASA-TM-X-69407

Descriptors: *Astrophysics, *Mission planning, *Space laboratories, *Space missions, *Space shuttles, Cosmic rays, Extraterrestrial radiation, Gamma rays, Payloads, Research projects, X ray astronomy.

For abstract, see STAR 1206

N74-15521/9GA PC$6.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE SPACE SHUTTLE PAYLOAD PLANNING WORKING GROUPS. VOLUME 4: LIFE SCIENCES.
Final Report.
May 73, 76p NASA-TM-X-69406

Descriptors: *Life sciences, *Mission planning, *Space laboratories, *Space missions, *Space shuttles, Environmental control, Exobiology, Human factors engineering, Life support systems, Payloads, Research projects.

For abstract, see STAR 1206

N74-15522/7GA PC$7.25/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE SPACE SHUTTLE PAYLOAD PLANNING WORKING GROUPS. VOLUME 5: SOLAR PHYSICS.
Final Report.
May 73, 101p NASA-TM-X-69405

Descriptors: *Mission planning, *Solar physics, *Space laboratories, *Space missions, *Space shuttles, Payloads, Research projects, Solar flares, Solar instruments, Solar radiation, Solar wind, Test equipment.

For abstract, see STAR 1206

N74-15523/5GA PC$6.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE SPACE SHUTTLE PAYLOAD PLANNING WORKING GROUPS. VOLUME 6: COMMUNICATIONS AND NAVIGATION.
Final Report.
May 73, 76p NASA-TM-X-69462

Descriptors: *Mission planning, *Space communication, *Space laboratories, *Space navigation, *Space shuttles, Equipment specifications, Payloads, Research projects, Spacecraft components, Test equipment.

For abstract, see STAR 1206

N74-15524/3GA PC$5.50/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE SPACE SHUTTLE PAYLOAD PLANNING WORKING GROUPS. VOLUME 7: EARTH OBSERVATIONS.
Final Report.
May 73, 66p NASA-TM-X-69461

Descriptors: *Earth surface, *Mission planning, *Satellite observation, *Space laboratories, *Space missions, *Space shuttles, Data acquisition, Equipment specifications, Payloads, Research projects, Test equipment.

For abstract, see STAR 1206

N74-15525/0GA PC$3.50/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE SPACE SHUTTLE PAYLOAD PLANNING WORKING GROUPS. VOLUME 8: EARTH AND OCEAN PHYSICS.
Final Report.
May 73, 30p NASA-TM-X-69460

Descriptors: *Geodesy, *Mission planning, *Oceanography, *Space laboratories, *Space missions, *Space shuttles, Data acquisition, Equipment specifications, Payloads, Spacecraft components, Test equipment.

For abstract, see STAR 1206

N74-15526/8GA PC$5.75/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE SPACE SHUTTLE PAYLOAD PLANNING WORKING GROUPS: VOLUME 9: MATERIALS PROCESSING AND SPACE MANUFACTURING.
Final Report.
May 73, 73p NASA-TM-X-69459

Descriptors: *Chemical reactions, *Space laboratories, *Space manufacturing, *Space missions, *Space shuttles, *Weightlessness, Equipment specifications, Payloads, Project management, Research projects, Test equipment.

For abstract, see STAR 1206

N74-15527/6GA PC$7.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE SPACE SHUTTLE PAYLOAD PLANNING WORKING GROUPS. VOLUME 10: SPACE TECHNOLOGY.
Final Report.
May 73, 96p NASA-TM-X-69457

Descriptors: *Mission planning, *Space laboratories, *Space shuttles, *Test equipment, *Test facilities, Equipment specifications, Payloads, Project management, Research projects, Spacecraft components.

For abstract, see STAR 1206

N74-15528/4GA PC$4.75/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE SPACE SHUTTLE PAYLOAD PLANNING WORKING GROUPS: EXECUTIVE SUMMARIES.
Final Report.
May 73, 51p NASA-TM-X-69464

Descriptors: *Mission planning, *Payloads, *Space laboratories, *Space missions, *Space shuttles, Data acquisition, Instruments, Research projects, Spacecraft components, Systems analysis.

For abstract, see STAR 1206

N74-15535/9GA PC$4.50/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
FROM SPACESHIPS TO ORBITING STATIONS: SECOND EDITION.
A. Y. Dmitriyev, V. P. Denisov, A. A. Yermilov, B. I. Zhelyabin, and A. V. Kirsanov. Dec 73, 135p
NASA-TT-F-812
Contract NASW-2035
Tran-Transl. Into English of the Book "Ot Kosmicheskikh Korabley - K Orbital'Nymn Stantsiyam" (2ND Ed., Revised and Expanded) Moscow, Mashinostr., 1971 p 1-113.

Descriptors: *Cosmonauts, *Manned space flight, *Space missions, *Spacecraft configurations, *U.s.s.r. space program, Soyuz spacecraft, Voskhod manned spacecraft, Vostok spacecraft.

For abstract, see STAR 1206

N74-15693/6GA PC$3.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
WILL THERE BE A MEETING WITH OTHER INTELLIGENT BEINGS .
D. Bolshov, L. M. Gindilis, and B. N. Panovkin.
Jan 74, 16p NASA-TT-F-15279
Contract NASW-2481
Tran-Transl. Into English from Ogonek (Moscow), No. 42, 13 Oct. 1973 p 24-26.

Descriptors: *Communication, *Extraterrestrial life, Exobiology, Intelligence, U.s.s.r..

For abstract, see STAR 1206

N74-15694/4GA PC$3.25/MF$1.45
Czechoslovak National Committee of COSPAR, Prague.
SPACE RESEARCH ACTIVITIES IN CZECHOSLOVAKIA IN 1972.
1973, 22p

Descriptors: *Czechoslovakia, *Research projects, *Space programs, Ionospheric propagation, Radiation hazards, Satellite observation, Solar activity.

For abstract, see STAR 1206

22B. Spacecraft

N74-15073/1GA PC$12.25/MF$1.45
General Electric Co., Philadelphia, Pa. Space Div.
ERTS-1 FLIGHT EVALUATION REPORT, 23 APRIL - 23 JULY 1973.
10 Aug 73, 205p NASA-CR-136617, DOC-73SD4260
Contract NAS5-21808

Descriptors: *Earth resources technology satellites, *Systems analysis, Attitude control, Data systems, Flight characteristics, Orbital mechanics, Telemetry.

For abstract, see STAR 1206

N74-15463/4GA PC$18.00/MF$1.45
Hamilton Standard Div., United Aircraft Corp., Windsor Locks, Conn.
VELOCITY CONTROL PROPULSION SUBSYSTEM OF THE RADIO ASTRONOMY EXPLORER SATELLITE FOR GODDARD SPACE FLIGHT CENTER.
Final Report.
W. Braught, E. K. Moore, and R. L. Steinberg.
1973, 317p NASA-CR-132905, SVHSER-6226
Contract NAS5-11463

Descriptors: *Explorer 49 satellite, *Spacecraft orbits, *Spacecraft propulsion, Lunar orbits, Propulsion system performance, Velocity.

For abstract, see STAR 1206

N74-15529/2GA PC$3.25/MF$1.45
Rockwell International Corp., Downey, Calif. Space Div.
SPACE SHUTTLE ORBITER FRACTURE CONTROL PLAN.
Mar 73, 21p NASA-CR-136554, SD73-SH-0082
Contract NAS9-14000

Descriptors: *Fractures (Materials), *Project management, *Space shuttle orbiters, Crack initiation, Crack propagation, Reliability engineering, Structural analysis.

For abstract, see STAR 1206

N74-15530/0GA PC$8.75/MF$1.45
Lockheed Missiles and Space Co., Sunnyvale, Calif.
UNSTEADY AERODYNAMIC ANALYSIS OF SPACE SHUTTLE VEHICLES. PART 2: STEADY AND UNSTEADY AERODYNAMICS OF SHARP-EDGED DELTA WINGS.
Final Technical Report.
L. E. Ericsson, and J. P. Reding. Aug 73, 134p
NASA-CR-120123, LMSC-D352320-PT-2
Contract NAS8-28130

Descriptors: *Aerodynamic characteristics, *Aerodynamic loads, *Space shuttles, *Spacecraft configurations, *Subsonic speed, Flow characteristics, Incompressible flow, Slender wings, Vortices, Wing planforms.

For abstract, see STAR 1206

N74-15531/8GA PC$7.25/MF$1.45
Lockheed Missiles and Space Co., Sunnyvale, Calif.
UNSTEADY AERODYNAMIC ANALYSIS OF SPACE SHUTTLE VEHICLES. PART 3: BOOSTER INTERFERENCE EFFECTS.
Final Technical Report.
J. P. Reding, and L. E. Ericsson. Aug 73, 103p
NASA-CR-120124, LMSC-D352320-PT-3
Contract NAS8-28130

Descriptors: *Aerodynamic characteristics, *Flow geometry, *Interference drag, *Separated flow, *Space shuttles, *Spacecraft configurations, Aeroelasticity, Spacecraft stability, Structural analysis, Vortices.

For abstract, see STAR 1206

N74-15532/6GA PC$5.50/MF$1.45
Lockheed Missiles and Space Co., Sunnyvale, Calif.
UNSTEADY AERODYNAMIC ANALYSIS OF SPACE SHUTTLE VEHICLES. PART 4: EFFECT OF CONTROL DEFLECTIONS ON ORBITER UNSTEADY AERODYNAMICS.
Final Technical Report.
J. P. Reding, and L. E. Ericsson. Aug 73, 66p
NASA-CR-120125, LMSC-D352320-PT-4
Contract NAS8-28130

Descriptors: *Aerodynamic characteristics, *Boundary layer flow, *Space shuttle orbiters, *Spacecraft configurations, *Unsteady flow, Flow geometry, Separated flow, Spacecraft stability, Transonic speed.

For abstract, see STAR 1206

N74-15537/5GA PC$41.25/MF$1.45
Chrysler Corp., New Orleans, La.
EXPERIMENTAL INVESTIGATIONS OF AN 0.0405 SCALE SPACE SHUTTLE CONFIGURATION 3 ORBITER TO DETERMINE SUBSONIC STABILITY CHARACTERISTICS. VOLUME I: OA21A.
B. W. Cameron, and A. J. Ritschel. Nov 73, 783p
NASA-CR-128792, DMS-DR-2053-VOL-1
Contract NAS9-13247

Descriptors: *Aerodynamic characteristics, *Low speed wind tunnels, *Space shuttle orbiters, Aerodynamic configurations, Aerodynamic forces, Angle of attack, Static pressure, Tables (Data).

For abstract, see STAR 1206

N74-15538/3GA PC$50.00/MF$1.45
Chrysler Corp., New Orleans, La. Data Management Services.
RESULTS OF TESTS OA12 AND IA9 IN THE AMES RESEARCH CENTER UNITARY PLAN WIND TUNNELS ON AN 0.030-SCALE MODEL OF THE SPACE SHUTTLE VEHICLE 2A TO DETERMINE AERODYNAMIC LOADS, VOLUME 4.
R. H. Spangler. Oct 73, 956p NASA-CR-128794-VOL-4, DMS-DR-2032-VOL-4
Contract NAS9-13247
Seri-18.

Descriptors: *Aerodynamic loads, *Space shuttles, *Wind tunnel tests, Angle of attack, Incidence, Mach number, Sideslip.

For abstract, see STAR 1206

N74-15539/1GA PC$52.00/MF$1.45
Chrysler Corp., New Orleans, La.
RESULTS OF TESTS OA12 AND IA9 IN THE AMES RESEARCH CENTER UNITARY PLAN WIND TUNNELS ON AN 0.030-SCALE MODEL OF THE SPACE SHUTTLE VEHICLE 2A TO DETERMINE AERODYNAMIC LOADS, VOLUME 5.
R. H. Spangler. Oct 73, 1000p NASA-CR-128794-VOL-5, DMS-DR-2032-VOL-5
Contract NAS9-13247

Descriptors: *Aerodynamic loads, *Space shuttles, *Wind tunnel tests, Angle of attack, Fuselages, Mach number, Pressure distribution, Spacecraft models.

For abstract, see STAR 1206

N74-15540/9GA PC$45.75/MF$1.45
Chrysler Corp., New Orleans, La. Data Management Services.
RESULTS OF TESTS OA12 AND IA9 IN THE AMES RESEARCH CENTER UNITARY PLAN WIND TUNNELS ON AN 0.030-SCALE MODEL OF THE SPACE SHUTTLE VEHICLE 2A TO DETERMINE AERODYNAMIC LOADS, VOLUME 6.
R. H. Spangler. Oct 73, 871p NASA-CR-128794-VOL-6, DMS-DR-2032-VOL-6
Contract NAS9-13247
Seri-18.

Descriptors: *Aerodynamic loads, *Space shuttles, *Wind tunnel tests, Angle of attack, Incidence, Mach number, Sideslip.

For abstract, see STAR 1206

N74-15541/7GA PC$47.50/MF$1.45
Chrysler Corp., New Orleans, La. Data Management Services.
RESULTS OF TESTS OA12 AND IA9 IN THE AMES RESEARCH CENTER UNITARY PLAN WIND TUNNELS ON AN 0.030 SCALE MODEL OF THE SPACE SHUTTLE VEHICLE 2A TO DETERMINE AERODYNAMIC LOADS, VOLUME 7.
R. H. Spangler. Nov 73, 908p NASA-CR-128794-VOL-7, DMS-DR-2032-VOL-7
Contract NAS9-13247
Seri-18.

Descriptors: *Aerodynamic loads, *Space shuttles, *Wind tunnel tests, Angle of attack, Incidence, Mach number, Sideslip.

For abstract, see STAR 1206

N74-15542/5GA PC$6.75/MF$1.45
Chrysler Corp., New Orleans, La.
RESULTS OF TESTS OA12 AND IA9 IN THE AMES RESEARCH CENTER UNITARY PLAN WIND TUNNELS OF AN 0.030 SCALE MODEL OF THE SPACE SHUTTLE VEHICLE 2A TO DETERMINE AERODYNAMIC LOADS, VOLUME 8.
R. H. Spangler. Nov 73, 1051p NASA-CR-128794-VOL-8, DMS-DR-2032-VOL-8
Contract NAS9-13247

Descriptors: *Aerodynamic loads, *Space shuttles, *Wind tunnel tests, Angle of attack, Charts, Mach number, Pressure measurements, Spacecraft models.

For abstract, see STAR 1206

N74-15543/3GA PC$4.50/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
A SYSTEMS PLAN FOR AN EARTH AND OCEAN DYNAMICS SATELLITE APPLICATIONS PROGRAM.
J. W. Siry. Nov 70, 48p NASA-TM-X-70547, X-550-70-473

Descriptors: *Geophysical satellites, *Satellite tracking, *Tectonics, Continental drift, Earth movements, Geodesy, Interferometry, Ocean surface, Polar orbits.

For abstract, see STAR 1206

N74-15544/1GA PC$4.75/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
A GEOPAUSE SATELLITE SYSTEM CONCEPT.
J. W. Siry. Apr 71, 53p NASA-TM-X-70548, X-550-71-503
Subm-Submitted for Publication. Conf-Presented at 3D Intern. Symp. On the Use of Artificial Satellites for Geodesy, Washington, D. C., Apr. 1971; Sponsored by the AM. Geophys. Union.

Descriptors: *Geophysical satellites, *Orbit calculation, *Tracking networks, Earth tides, Geodetic surveys, Meteorology, Oceanography, Sea roughness, Tracking stations.

For abstract, see STAR 1206

N74-15545/8GA PC$4.50/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SPACECRAFT CONTROL SECTION FOR THE IMPROVED SMALL ASTRONOMY SATELLITE (SAS).
M. R. Townsend. Jan 74, 46p NASA-TM-X-70569, X-405-74-7

Descriptors: *Satellite control, *Small astronomy satellites, Attitude (Inclination), Satellite design, Spacecraft structures.

For abstract, see STAR 1206

N74-15660/3GA PC$29.00/MF$1.45
General Dynamics/Convair, San Diego, Calif. Aerospace Div.
EVALUATION OF COATED COLUMBIUM ALLOY HEAT SHIELDS FOR SPACE SHUTTLE THERMAL PROTECTION SYSTEM APPLICATION. VOLUME 2, PHASE 2: SUBSIZE HEAT SHIELD AND SMALL SIZE TPS EVALUATION.
Report for Feb. 1971 - Jul. 1973.
W. E. Black. Aug 73, 540p NASA-CR-112119-2
Contract NAS1-9793

Descriptors: *Heat shielding, *Niobium, *Space shuttles, *Thermal protection, Panels, Performance prediction, Structural reliability, Systems engineering, Weight analysis.

For abstract, see STAR 1206

PATENT-3 749 914 Not available NTIS
Department of the Air Force Washington D C
VEHICLE ATTITUDE SENSOR.
Patent.
Richard M. Terasaki. Filed 21 Dec 70, patented 31 Jul 73, 8p Rept nos. PAT-APPL-99 951,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Satellite attitude, *Patents, Communication satellites, Attitude control systems, Detectors, Stabilization systems.
Identifiers: PAT-CL-250-83-3-H.

The patent relates to an apparatus to control the alignment of the spin axis of a communications satellite with the major axis of an eccentric, near polar orbit. The on-board prediction of the time of apogee passage and autonomous control at apogee for the spin axis alignment with the local vertical is also provided. Thus, cumulative errors in the apogee epoch predictions due to orbital period errors are avoided.

PATENT-3 780 966 Not available NTIS
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
ATTITUDE SENSOR.
Patent.
A. L. Newcomb, Jr., and A. G. Price. Patented 25 Dec 73, 4p NASA-CASE-LAR-10586-1,
Misc-Filed 14 Sep. 1972 Supersedes N73-11406 (11 - 02, p 0174).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Attitude control, *Attitude indicators, *Light sources, *Optical equipment, *Spacecraft stability, Equipment specifications, *Patents, Product development.

A device for controlling the attitude of a spacecraft is described. The device consists of two light sensors on a spacecraft that are mounted beneath a baffle which divides the light from a light source such as the sun or a star. The divided light reflects off of two reflective surfaces onto the two light sensors. When the spacecraft assumes its normal attitude, the baffle divides the light source into two equal parts, causing the two light sensors to produce equal outputs. When the light is equally detected, the stabilizing system is disconnected. Deviations from the normal attitude cause unequal distribution of the light source and energize the stabilizing system.

22C. Spacecraft Trajectories and Reentry

AD-774 899/8GA PC$10.50/MF$1.45
Old Dominion Systems Inc Gaithersburg Md
A PHOTOGRAMMETRIC AND TRACKING NETWORK ANALYSIS PROGRAM.
Final rept.,
John G. Hartwell, Fred M. Loveless, and Georg E. Morduch. Oct 73, 146p ETL-CR-73-17
Contract DAAK02-72-C-0434

Descriptors: *Satellite tracking systems, *Computer programming, Orbits, Photometry, Optical tracking, Algorithms, Equations of motion, Taylors series, FORTRAN.
Identifiers: FOTONAP computer program, CDC 6600 computers, NAP computer program, IBM 360/95 computers.

The Photogrammetric and Tracking Network Analysis Program (FOTONAP) is a rigorous general purpose long arc multi-satellite orbit determination and parameter estimation program. It is capable of simultaneously processing photogrammetric observations collected by an orbiting camera along with observations from conventional ground based and satellite to satellite tracking systems. In addition to the recovery of satellite or-

bits the program provides estimates for the relative location of ground points (observed by the orbiting camera), various camera error model parameters, the location of ground based tracking systems, plus an ensemble of error model parameters associated with the various tracking instruments. The entire program is written in FORTRAN and is operational under the SCOPE 3.3/3.4 system on the CDC 6600 computer system. (Author)

AD-774 913/8GA PC$4.75/MF$1.45
Naval Weapons Lab Dahlgren Va
MATHEMATICAL FORMULATION FOR PRELAUNCH ANALYSES OF THE SOLRAD-HI SATELLITE SYSTEM.
Technical rept.,
Bruce Herman, and Everett Swift. Nov 73, 31p
Rept no. NWL-TR-3070

Descriptors: *Scientific satellites, *Launching, Mathematical analysis, Circular orbits, Synchronism.
Identifiers: SOLRAD-HI satellites, SOLRAD satellites, Titan 3.

Two SOLRAD-HI satellites are to be placed into synchronous orbit by a single launch vehicle in the Spring of 1975. Their ultimate destinations are similar 5.4 day circular orbits with spacing between satellites of 180 degrees. The restrictions and constraints placed on the launch sequence from synchronous to final orbit are reviewed. Included are some basic formulations intended to serve as a guide to the methods employed in the analysis. (Author)

AD-775 144/9GA PC$3.75/MF$1.45
Massachusetts Inst of Tech Lexington Lincoln Lab
DESIGN OF AN AUTONOMOUS STATION-KEEPING CONTROLLER FOR LES-8/9.
Technical note,
Sushanta Srivastava, and Roger W. Brockett. 21 Feb 74, 62p Rept no. TN-1974-1 ESD-TR-74-39
Contract F19628-73-C-0002

Descriptors: *Synchronous satellites, *Transfer trajectories, *Attitude control systems, Thrusters, Maneuvering satellites, Digital filters, Perturbations, Fuel consumption.
Identifiers: LES-8 satellite, LES-9 satellite, Stationkeeping.

The report describes the design of the controller and digital filter for the LES-8/9 autonomous stationkeeping system. The design goals are to maintain a station with plus or minus 0.15 deg. accuracy with an efficient thruster fuel usage and execute automatic station changes when necessary at a controlled coasting speed. These goals are accomplished by using a time-varying eighth-and sixteenth-order filter, and a non-linear controller with switching zones. The final design is optimized taking into account stochastic nature of the navigation error. The controller parameters and filters can be altered in orbit to achieve the optimum performance for the navigation error seen in orbit. (Author)

N74-15491/5GA PC$5.50/MF$1.45
Academy of Sciences (USSR), Ryazan.
RESULTS OF OBSERVATIONS OF SCIENTIFIC EARTH SATELLITES. POLET 1 1963 43 1; VISUAL OBSERVATIONS, EQUATORIAL COORDINATES (1950.0), MARCH - JUNE 1971 REZULTATY NABLYUDENIY ISKUSSTVENNYKH SPUTNIKOV ZEMLI. POLET 1 1963 43 1; VIZUALNYYE NABLYUDENIYA, EKVATORIALNYYE COORDINATY (1950.0), MART - IYUN 1971 G.
1973, 66p REPT-13(153)
Language in Russian.

Descriptors: *Satellite tracking, *Scientific satellites, Coordinates, Earth satellites, Ground stations, Optical measuring instruments, Tables (Data), U.s.s.r..

For abstract, see STAR 1206

N74-15492/3GA PC$5.25/MF$1.45
Academy of Sciences (USSR), Ryazan.
RESULTS OF OBSERVATIONS OF SCIENTIFIC EARTH SATELLITES. EXPLORER 19 1963 53 1; VISUAL OBSERVATIONS, HORIZONTAL COORDINATES, JANUARY - JULY 1971 REZULTATY NABLYUDENIY ISKUSSTVENNYKH SPUTNIKOV ZEMLI. EKSPLORER 19 1963 53 1; VIZUALNYYE NABLYUDENIYA, GORIZONTALNYYE KOORDINATY, YANVAR - IYUL 1971 G.
1973, 63p REPT-6(146)
Language in Russian.

Descriptors: *Explorer 19 satellite, *Satellite tracking, Coordinates, Ground stations, Optical measuring instruments, Tables (Data), U.s.s.r..

For abstract, see STAR 1206

N74-15493/1GA PC$6.00/MF$1.45
Academy of Sciences (USSR), Ryazan.
RESULTS OF OBSERVATIONS OF SCIENTIFIC EARTH SATELLITES. SAMOS 2 1961 01 1, POLET 1 1963 43 1, EXPLORER 32 1966 44 1, EXPLORER 39 1968 66 1; VISUAL OBSERVATIONS, HORIZONTAL COORDINATES, MARCH - DECEMBER 1971 REZULTATY NABLYUDENIY ISKUSSTVENNYKH SPUTNIKOV ZEMLI. SAMOS 2 1961 01 1, POLET 1 1963 43 1, EKSPLORER 32 1966 44 1, EKSPLORER 39 1968 66 1; VIZUALNYYE NABLYUDENIYA GORIZONTALNYYE KOORDINATY, MART - DEKABR 1971 G.
1973, 76p REPT-12(152)
Language in Russian.

Descriptors: *Explorer 32 satellite, *Explorer 39 satellite, *Samos, *Satellite tracking, Coordinates, Ground stations, Optical measuring instruments, Tables (Data), U.s.s.r..

For abstract, see STAR 1206

N74-15494/9GA PC$5.25/MF$1.45
Academy of Sciences (USSR), Ryazan.
RESULTS OF OBSERVATIONS OF SCIENTIFIC EARTH SATELLITES. SAMOS 2 1961 01 1; VISUAL OBSERVATIONS, EQUATORIAL COORDINATES (1950.0), MARCH - SEPTEMBER 1971 REZULTATY NABLYUDENIY ISKUSSTVENNYKH SPUTNIKOV ZEMLI. SAMOS 2 1961 1 1; VIZUALNYYE NABLYUDENIYA, EKVATORIALNYYE KOORDINATY (1950.0), MART - SENTYABR 1971 G.
1973, 64p REPT-11(151)
Language in Russian.

Descriptors: *Samos, *Satellite tracking, Coordinates, Ground stations, Optical measuring instruments, Tables (Data), U.s.s.r..

For abstract, see STAR 1206

N74-15495/6GA PC$5.25/MF$1.45
Academy of Sciences (USSR), Ryazan.
RESULTS OF OBSERVATIONS OF SCIENTIFIC EARTH SATELLITES. EXPLORER 19 1963 53 1, EXPLORER 39 1968 66 1; VISUAL OBSERVATIONS, EQUATORIAL COORDINATES (1950.0), OCTOBER - NOVEMBER 1971 REZULTATY NABLYUDENIY ISKUSSTVENNYKH SPUTNIKOV ZEMLI. EKSPLORER 19 1963 53 1, EKSPLORER 39 1968 66 1; VIZUALNYYE NABLYUDENIYA, EKVATORIALNYYE KOORDINATY (1950.0), OKTYABR - NOYABR 1971 G.
1972, 61p REPT-10(150)
Language in Russian.

Descriptors: *Explorer 19 satellite, *Explorer 39 satellite, *Satellite tracking, Coordinates, Ground stations, Optical measuring instruments, Tables (Data), U.s.s.r..

For abstract, see STAR 1206

N74-15496/4GA PC$5.25/MF$1.45
Academy of Sciences (USSR), Ryazan.
RESULTS OF OBSERVATIONS OF SCIENTIFIC EARTH SATELLITES. EXPLORER 32 1966 44 1, EXPLORER 39 1968 66 1; VISUAL OBSERVATIONS, EQUATORIAL COORDINATES (1950.0), MARCH - DECEMBER 1971, APRIL - SEPTEMBER 1971 REZULTATY NABLYUDENIY ISKUSSTVENNYKH SPUTNIKOV ZEMLI. EKSPLORER 32 1966 44 1, EKSPLORER 39 1968 66 1; VIZUALNYYE NABLYUDENIYA, EKVATORIALNYYE KOORDINATY (1950.0), MART - DEKABR 1971 G, APREL - SENTYABR 1971 G.
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Descriptors: *Explorer 32 satellite, *Explorer 39 satellite, *Satellite tracking, Coordinates, Ground stations, Optical measuring instruments, Tables (Data), U.s.s.r..

For abstract, see STAR 1206

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Academy of Sciences (USSR), Ryazan.
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Language in Russian.

Descriptors: *Explorer 19 satellite, *Satellite tracking, Coordinates, Ground stations, Optical measuring instruments, Tables (Data), U.s.s.r..

For abstract, see STAR 1206

N74-15498/0GA PC$5.50/MF$1.45
Academy of Sciences (USSR), Ryazan.
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Descriptors: *Explorer 19 satellite, *Satellite tracking, Coordinates, Ground stations, Optical measuring instruments, Tables (Data), U.s.s.r..

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D. Koch, P. Argentiero, and W. D. Kahn. Nov 73, 25p 0NASA-TM-X-70558, 0X-591-73-368

Descriptors: *Flight altitude, *Geos satellites (Esro), *Space environment simulation, Covariance, Error analysis, Orbit calculation.

For abstract, see STAR 1206

N74-15509/4GA PC$5.25/MF$1.45
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X. Berger. Jun 73, 65p 0GRGS-BULL-80
In French; English Summary.

Descriptors: *Artificial satellites, *Euler-lagrange equation, *Geopotential, Long term effects, Numerical integration, Orbit calculation, Orbital elements, Satellite orbits, Tesseral harmonics, Zonal harmonics.

For abstract, see STAR 1206

N74-15536/7GA PC$2.75/MF$1.45
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
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J. E. Pavlosky, and L. G. St.Leger. Jan 74, 25p 0NASA-TN-D-7564, 0JSC-S-383

Descriptors: *Apollo spacecraft, *Atmospheric entry, *Atmospheric heating, *Command modules, *Spacecraft structures, *Thermal protection, Ablation, Heat transfer, Reentry physics, Systems engineering.

For abstract, see STAR 1206

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N74-15501/1GA PC$3.00/MF$1.45
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Nov 73, 13p 0NASA-CR-136562, 0JPL-TM-32-444-REV-2
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Descriptors: *Computers, *Facilities, *Information dissemination, *Space flight, Command and control, Ground stations, Telemetry, Tracking stations.

For abstract, see STAR 1206

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This list comprises all the reports cited in this issue. It is arranged alpha-numerically by accession number. The subject field and group where the report citation can be located in the journal precedes the accession number.

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18G ARH-231(Del.)
18G ARH-2384
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08H ARH-2757(Pt.4)
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08H HW-72645-RD
13B HW-80888(Del.)
20I IAE-2232
18A IAE-2246
20I IAE-2254
20H IKF-31
20H INP-823
18D INP-836
20I IPP-III-10
20I IPP-IV-58
18A IPP-1-134
18A IPP-2-215
18A IPP-4-101
20E IPP-4-110
20L IS-T-590
11F IS-T-608
20L IS-T-615
20H IS-T-617
20H ITF-73-122-P
20H ITF-73-123-P
20M ITF-73-76-P
20H ITF-73-86-P
20H ITF-73-87-P
20H ITF-73-91-P
20H ITF-73-95-P
20H ITF-73-97-P
07E JINR-E12-7547
20H JINR-E2-7257
20H JINR-E2-7461
20J JINR-E2-7485
20H JINR-E2-7508
20J JINR-E2-7540
20J JINR-E2-7562
20J JINR-E4-7315
20L JINR-E4-7417
20H JINR-E4-7535
20H JINR-E6-7419
20H JINR-P1-7439
20H JINR-P1-7475
18D JINR-P10-7284
18D JINR-P10-7460
20I JINR-P11-7299
07E JINR-P12-7423
07D JINR-P12-7447
18D JINR-P13-7492
20G JINR-P13-7512
20H JINR-P15-7401
20G JINR-P16-7335
20J JINR-P2-7310
20H JINR-P2-7324
20H JINR-P2-7436
20H JINR-P2-7490
20H JINR-P2-7507
07D JINR-P2-7530
20H JINR-P2-7531
20H JINR-P3-7282
18D JINR-P3-7379
20M JINR-P3-7519
20H JINR-P4-7316
20H JINR-P4-7350
20H JINR-P4-7437
20H JINR-P4-7479
20H JINR-P7-7409
20G JINR-P9-7261
20G JINR-P9-7449
09B JPRS-61131
06E JPRS-61143
05J JPRS-61146
03A JPRS-61147
20E JPRS-61199
05B JPRS-61234
06C JPRS-61252
18E JUL-932-RG
20L JUL-942-FF
18J JUL-969-RW
18J JUL-989-RW
09B KAPL-M-7313
11B KFK-EXT-6/73-3
17B KFK-PDV-7
12A KFK-PDV-9
20H KFK-1826
06R KFK-1829
18J KFK-1835
18I KFK-1858
20M KFK-1860
10B KFK-1870
14B KFK-1871
09B KFK-1873
18K KFKI-73-48
20L KFKI-73-54
20H KFKI-73-59
20D LA-UR-73-1473
18D LA-UR-73-1564
18A LA-UR-73-1612
18A LA-UR-73-1613
20H LA-5400-MS
20H LA-5424-MS
18C LA-5425-MS
09B LA-5430-MS
20I LA-5448-MS
18C LA-5449-MS
18D LA-5455-MS
20E LA-5458-MS
06C LBL-1534
07D LBL-1816
20H LBL-1991
20H LBL-2115
20H LBL-2320
20G LBL-2418
18D LBL-2419
18D LBL-2420
20G LBL-2422
18D LBL-2423
18A LBL-2425
06R LBL-2449
20G LBL-2601
20H LNF-73-5
18D LNF-73-8
20G LPS-136
20I LRP-62-73
20I LRP-67-73
18D LURI-1973-5
20H LYCEN-7305
07D LYCEN-7307
20H LYCEN-7319
13B MHSMP-71-27
18E NEDO-10183
07D NLCO-1105
20H NP-19798
20J NP-19808
18B NP-19864
20H NP-19873
20G NP-19890
20H NP-19891
20H NP-19892
18D NP-19893
18B NP-19902
18B NP-19903
18G NP-19911
18H NRPB-R-12
08H NYO-3425-8
01A N74-14702/6GA
01A N74-14708/3GA
01A N74-14739/8GA
01A N74-14740/6GA
01A N74-14741/4GA
01A N74-14744/8GA
01A N74-14745/5GA
01A N74-14748/9GA
01C N74-14749/7GA
01C N74-14750/5GA
01B N74-14751/3GA
01B N74-14752/1GA

22A	N74-14753/9GA	22B	N74-15073/1GA	22C	N74-15491/5GA	15C	ORNL-4860
01C	N74-14754/7GA	04A	N74-15079/8GA	22C	N74-15492/3GA	18H	ORNL-4903
01A	N74-14755/4GA	04A	N74-15080/6GA	22C	N74-15493/1GA	09B	ORNL-4929
01A	N74-14756/2GA	04A	N74-15099/6GA	22C	N74-15494/9GA	18N	ORNL-4932
01A	N74-14757/0GA	20F	N74-15100/2GA	22C	N74-15495/6GA	20H	ORO-1316-168
01A	N74-14758/8GA	09A	N74-15103/6GA	22C	N74-15496/4GA	20H	ORO-1316-169
01A	N74-14759/6GA	17G	N74-15104/4GA	22C	N74-15497/2GA	07E	ORO-1797-45
01B	N74-14760/4GA	14B	N74-15109/3GA	22C	N74-15498/0GA	07E	ORO-2001-29
01A	N74-14761/2GA	18D	N74-15110/1GA	03A	N74-15500/3GA	06R	ORO-2583-11
01C	N74-14762/0GA	13I	N74-15132/5GA	22D	N74-15501/1GA	06R	ORO-2583-12
01C	N74-14763/8GA	13H	N74-15133/3GA	22A	N74-15504/5GA	09B	ORO-4061-10
01B	N74-14764/6GA	06D	N74-15134/1GA	22C	N74-15505/2GA	04B	ORO-4199-2
01C	N74-14765/3GA	13I	N74-15136/6GA	03C	N74-15506/0GA	20H	ORO-4317-32
01A	N74-14766/1GA	17B	N74-15149/9GA	22A	N74-15507/8GA	20E	PAT-APPL-300 002
01A	N74-14767/9GA	17H	N74-15150/7GA	22A	N74-15508/6GA	21H	PAT-APPL-301 029
10B	N74-14785/1GA	11F	N74-15182/0GA	22C	N74-15509/4GA	11A	PAT-APPL-304 585
10B	N74-14786/9GA	13H	N74-15183/8GA	22A	N74-15517/7GA	01A	PAT-APPL-306 504
10B	N74-14787/7GA	11F	N74-15184/6GA	22A	N74-15518/5GA	11E	PAT-APPL-306 648
10B	N74-14788/5GA	11F	N74-15185/3GA	22A	N74-15519/3GA	07C	PAT-APPL-306 770
10B	N74-14789/3GA	11F	N74-15188/7GA	22A	N74-15520/1GA	11E	PAT-APPL-309 833
06S	N74-14793/5GA	11F	N74-15189/5GA	22A	N74-15521/9GA	07C	PAT-APPL-311 609
06S	N74-14813/1GA	11F	N74-15208/3GA	22A	N74-15522/7GA	11E	PAT-APPL-314 651
06F	N74-14823/0GA	07D	N74-15209/1GA	22A	N74-15523/5GA	14E	PAT-APPL-319 591
06A	N74-14825/5GA	11F	N74-15210/9GA	22A	N74-15524/3GA	01C	PAT-APPL-328 158
06S	N74-14826/3GA	11E	N74-15211/7GA	22A	N74-15525/0GA	07C	PAT-APPL-329 509
06A	N74-14827/1GA	11C	N74-15212/5GA	22A	N74-15526/8GA	01C	PAT-APPL-338 728
06S	N74-14828/9GA	07D	N74-15283/6GA	22A	N74-15527/6GA	11F	PAT-APPL-341 634
06S	N74-14829/7GA	07D	N74-15285/1GA	22A	N74-15528/4GA	02F	PAT-APPL-395 025
06P	N74-14830/5GA	14B	N74-15286/9GA	22B	N74-15529/2GA	17G	PAT-APPL-419 747
06I	N74-14831/3GA	11J	N74-15287/7GA	22B	N74-15530/0GA	11G	PAT-APPL-419 748
06S	N74-14832/1GA	19D	N74-15288/5GA	22B	N74-15531/8GA	09E	PAT-APPL-433 968
06B	N74-14833/9GA	07E	N74-15289/3GA	22B	N74-15532/6GA	06F	PATENT-2 821 499
06S	N74-14834/7GA	12B	N74-15300/8GA	22A	N74-15535/9GA	06F	PATENT-2 955 068
06N	N74-14835/4GA	12A	N74-15301/6GA	22C	N74-15536/7GA	09A	PATENT-2 974 184
06K	N74-14846/1GA	12A	N74-15302/4GA	22B	N74-15537/5GA	07A	PATENT-2 979 442
06B	N74-14847/9GA	12A	N74-15303/2GA	22B	N74-15538/3GA	13A	PATENT-2 983 810
11F	N74-14860/2GA	12A	N74-15304/0GA	22B	N74-15539/1GA	09E	PATENT-2 991 421
07C	N74-14862/8GA	12A	N74-15305/7GA	22B	N74-15540/9GA	11F	PATENT-3 016 296
07D	N74-14863/6GA	12A	N74-15306/5GA	22B	N74-15541/7GA	13B	PATENT-3 028 183
07C	N74-14864/4GA	12A	N74-15307/3GA	22B	N74-15542/5GA	13E	PATENT-3 045 861
07D	N74-14865/1GA	12A	N74-15308/1GA	22B	N74-15543/3GA	07A	PATENT-3 046 215
09D	N74-14889/1GA	12A	N74-15309/9GA	22B	N74-15544/1GA	13K	PATENT-3 054 243
17B	N74-14890/9GA	12A	N74-15310/7GA	22B	N74-15545/8GA	14B	PATENT-3 054 295
17B	N74-14891/7GA	12A	N74-15311/5GA	21C	N74-15546/6GA	11B	PATENT-3 054 685
17B	N74-14892/5GA	12A	N74-15312/3GA	21C	N74-15547/4GA	11F	PATENT-3 069 255
17B	N74-14894/1GA	12A	N74-15313/1GA	01C	N74-15594/6GA	14B	PATENT-3 069 907
14C	N74-14895/8GA	12A	N74-15314/9GA	20L	N74-15595/3GA	11F	PATENT-3 075 900
17B	N74-14896/6GA	12A	N74-15315/6GA	20K	N74-15618/3GA	11F	PATENT-3 078 997
03B	N74-14897/4GA	04B	N74-15332/1GA	20K	N74-15619/1GA	07A	PATENT-3 088 909
09E	N74-14898/2GA	04B	N74-15333/9GA	20K	N74-15620/9GA	06C	PATENT-3 103 202
03B	N74-14899/0GA	04B	N74-15334/7GA	20K	N74-15621/7GA	08J	PATENT-3 104 928
03B	N74-14900/6GA	13B	N74-15335/4GA	20K	N74-15622/5GA	11F	PATENT-3 107 215
03B	N74-14901/4GA	13B	N74-15336/2GA	20K	N74-15623/3GA	13I	PATENT-3 108 716
03B	N74-14902/2GA	13B	N74-15347/9GA	20K	N74-15624/1GA	07A	PATENT-3 113 017
03B	N74-14903/0GA	04B	N74-15348/7GA	21I	N74-15625/8GA	06C	PATENT-3 128 744
03B	N74-14904/8GA	04B	N74-15350/3GA	11D	N74-15626/6GA	07A	PATENT-3 138 637
03B	N74-14905/5GA	13B	N74-15354/5GA	20K	N74-15628/2GA	07D	PATENT-3 140 148
09E	N74-14909/7GA	04B	N74-15356/0GA	20K	N74-15630/8GA	13E	PATENT-3 148 577
09B	N74-14921/2GA	04B	N74-15357/8GA	20K	N74-15631/6GA	13I	PATENT-3 162 257
09B	N74-14925/3GA	01B	N74-15378/4GA	20K	N74-15654/8GA	08B	PATENT-3 164 905
09B	N74-14928/7GA	18J	N74-15388/3GA	13R	N74-15655/5GA	13M	PATENT-3 168 814
09B	N74-14929/5GA	18N	N74-15389/1GA	13A	N74-15656/3GA	08H	PATENT-3 175 459
09B	N74-14930/3GA	20L	N74-15399/0GA	07D	N74-15657/1GA	07A	PATENT-3 285 765
06B	N74-14957/6GA	20L	N74-15400/6GA	21B	N74-15658/9GA	07A	PATENT-3 289 753
13G	N74-14959/2GA	20A	N74-15405/5GA	13B	N74-15659/7GA	07A	PATENT-3 289 754
01A	N74-14960/0GA	07D	N74-15412/1GA	22B	N74-15660/5GA	07A	PATENT-3 290 286
01A	N74-14961/8GA	20L	N74-15434/5GA	20M	N74-15662/1GA	06M	PATENT-3 291 400
22A	N74-14962/6GA	20L	N74-15435/2GA	13B	N74-15669/6GA	13H	PATENT-3 305 091
01B	N74-14963/4GA	20L	N74-15436/0GA	15G	N74-15670/4GA	07C	PATENT-3 305 567
20D	N74-14973/3GA	20L	N74-15438/6GA	05A	N74-15671/2GA	13A	PATENT-3 321 009
20D	N74-14974/1GA	20L	N74-15439/4GA	05I	N74-15683/7GA	07A	PATENT-3 323 653
20M	N74-14975/8GA	21H	N74-15455/0GA	05A	N74-15692/8GA	07A	PATENT-3 323 857
20D	N74-14976/6GA	21E	N74-15456/8GA	22A	N74-15693/6GA	08I	PATENT-3 329 265
20D	N74-14978/2GA	21E	N74-15457/6GA	22A	N74-15694/4GA	07A	PATENT-3 332 894
20D	N74-14979/0GA	21E	N74-15458/4GA	17I	N74-15699/3GA	10B	PATENT-3 336 161
08M	N74-15051/7GA	21H	N74-15459/2GA	10B	ORNL-EIS-73-65(Rev.1)	13I	PATENT-3 337 889
04A	N74-15052/5GA	21E	N74-15460/0GA	18I	ORNL-NSIC-55(Vol.1)	07A	PATENT-3 384 451
04A	N74-15053/3GA	21H	N74-15461/8GA	06R	ORNL-TM-3837	13B	PATENT-3 385 786
08B	N74-15054/1GA	21C	N74-15462/6GA	18A	ORNL-TM-4201	14B	PATENT-3 387 487
08B	N74-15055/8GA	22B	N74-15463/4GA	18H	ORNL-TM-4266	07D	PATENT-3 397 040
20J	N74-15056/6GA	21E	N74-15464/2GA	18H	ORNL-TM-4322	07A	PATENT-3 450 267
05B	N74-15058/2GA	21E	N74-15465/9GA	18H	ORNL-TM-4335	07A	PATENT-3 458 972
08A	N74-15061/6GA	21E	N74-15466/7GA	11F	ORNL-TM-4380	07A	PATENT-3 463 713
08N	N74-15062/4GA	03B	N74-15472/5GA	20H	ORNL-TM-4389	14B	PATENT-3 463 717
08E	N74-15063/2GA	03B	N74-15473/3GA	07E	ORNL-TM-4403	07A	PATENT-3 463 814
04A	N74-15064/0GA	03B	N74-15474/1GA	20I	ORNL-TM-4421	09C	PATENT-3 463 981
08G	N74-15065/7GA	03B	N74-15475/8GA	11F	ORNL-TM-4423	13I	PATENT-3 464 502
04A	N74-15066/5GA	03B	N74-15476/6GA	20I	ORNL-TM-4432	08B	PATENT-3 464 766
04A	N74-15067/3GA	03B	N74-15480/8GA	18J	ORNL-tr-2733	13A	PATENT-3 466 189
08C	N74-15068/1GA	03B	N74-15481/6GA	20I	ORNL-tr-2744	07A	PATENT-3 476 654
08G	N74-15070/7GA	03B	N74-15489/9GA	18J	ORNL-tr-2788	07A	PATENT-3 477 942
08G	N74-15072/3GA	03B	N74-15490/7GA	18G	ORNL-4792	08I	PATENT-3 479 638

13B PATENT-3 480 144
13K PATENT-3 482 374
07D PATENT-3 482 635
06C PATENT-3 483 649
09E PATENT-3 518 448
10B PATENT-3 551 209
14B PATENT-3 553 501
13H PATENT-3 676 052
07C PATENT-3 676 056
07C PATENT-3 677 692
11L PATENT-3 680 219
11A PATENT-3 681 268
11E PATENT-3 694 256
13I PATENT-3 696 603
11E PATENT-3 697 316
11E PATENT-3 698 854
11E PATENT-3 698 857
07C PATENT-3 699 146
13H PATENT-3 701 626
11E PATENT-3 702 230
07C PATENT-3 702 232
07C PATENT-3 702 326
11E PATENT-3 702 753
11E PATENT-3 702 754
07C PATENT-3 702 857
07C PATENT-3 704 257
11E PATENT-3 705 004
07C PATENT-3 706 762
07C PATENT-3 708 450
07C PATENT-3 714 144
11E PATENT-3 714 813
07D PATENT-3 715 910
07C PATENT-3 716 540
07C PATENT-3 719 448
11E PATENT-3 722 202
11E PATENT-3 723 057
08H PATENT-3 723 133
13H PATENT-3 724 243
07D PATENT-3 731 466
07C PATENT-3 732 179
13A PATENT-3 732 397
11E PATENT-3 734 684
11E PATENT-3 734 685
07C PATENT-3 737 453
09E PATENT-3 742 390
09E PATENT-3 742 399
17I PATENT-3 742 501
07C PATENT-3 743 624
09D PATENT-3 743 765
09E PATENT-3 743 955
11C PATENT-3 744 295
06H PATENT-3 745 020
11E PATENT-3 745 191
17I PATENT-3 745 567
17I PATENT-3 745 568
13A PATENT-3 745 785
19A PATENT-3 745 877
07C PATENT-3 746 731
20E PATENT-3 747 004
13I PATENT-3 747 558
21E PATENT-3 747 875
07C PATENT-3 748 206
14B PATENT-3 748 892
19A PATENT-3 749 022
11E PATENT-3 749 552
22B PATENT-3 749 914
09E PATENT-3 749 963
14B PATENT-3 750 013
20E PATENT-3 750 048
09E PATENT-3 750 182
14B PATENT-3 753 472
20D PATENT-3 753 616
18F PATENT-3 754 141
08H PATENT-3 754 932
07C PATENT-3 755 418
07C PATENT-3 756 779
07B PATENT-3 757 412
11C PATENT-3 761 303
21H PATENT-3 762 644
09E PATENT-3 764 830
14B PATENT-3 777 552
10B PATENT-3 780 424
14B PATENT-3 780 563
21F PATENT-3 780 827
22B PATENT-3 780 966
17H PATENT-3 781 111
17H PATENT-3 781 549
18D PATENT-3 781 562
06G PATENT-3 781 933
13I PATENT-3 781 958
14B PATENT-3 782 177
11B PATENT-3 782 181
17G PATENT-3 782 205
13D PATENT-3 782 698
14B PATENT-3 782 699
11A PATENT-3 782 737
14E PATENT-3 782 825
20F PATENT-3 782 835
07A PATENT-3 782 904
09B PATENT-3 783 250
09A PATENT-3 783 354
09E PATENT-3 783 399
08B PATENT-3 968 869
07A PATENT-3 992 884
09B PB-227 071/8GA
09B PB-227 078/3GA
13B PB-227 468/6GA
05C PB-227 583/2GA
13B PB-227 715/0GA
09B PB-227 718/4GA
07A PB-227 802/6GA
13A PB-227 815/8GA
13B PB-227 823/2GA
13M PB-227 841/4GA
06A PB-227 849/7GA
10B PB-227 859/6GA
07D PB-227 874/5GA
04B PB-227 892/7GA
13B PB-227 965/1GA
07D PB-227 966/9GA
07D PB-228 006/3GA
20D PB-228 020/4GA
13B PB-228 050/1GA
07A PB-228 061/8GA
14B PB-228 094/9GA
11F PB-228 103/8GA
11F PB-228 107/9GA
13B PB-228 118/6GA
08H PB-228 131/9GA
13F PB-228 136/8GA
11F PB-228 143/4GA
13B PB-228 146/7GA
13B PB-228 148/3GA
06J PB-228 152/5GA
13B PB-228 183/0GA
05C PB-228 257/2GA
05B PB-228 258/0GA
13B PB-228 325/7GA
13B PB-228 326/5GA
13B PB-228 329/9GA
13B PB-228 330/7GA
13B PB-228 346/3GA
05C PB-228 348/9GA
05I PB-228 383/6GA
13B PB-228 384/4GA
06T PB-228 439/6GA
13B PB-228 440/4GA
13B PB-228 441/2GA
13B PB-228 442/0GA
06E PB-228 445/3GA
13B PB-228 447/9GA
13B PB-228 448/7GA
13C PB-228 449/5GA
13B PB-228 456/0GA
13M PB-228 458/6GA
12A PB-228 460/2GA
13F PB-228 470/1GA
13C PB-228 473/5GA
09B PB-228 474/3GA
05A PB-228 486/7GA
13B PB-228 511/2GA
06L PB-228 519/5GA
06T PB-228 520/3GA
06T PB-228 521/1GA
13B PB-228 524/5GA
06T PB-228 526-T/GA
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06H PB-228 538/5GA
06H PB-228 539/3GA
06H PB-228 540/1GA
06H PB-228 541/9GA
06H PB-228 543/5GA
06H PB-228 544/3GA
06H PB-228 545/0GA
06H PB-228 546/8GA
06H PB-228 547/6GA
06H PB-228 548/4GA
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06H PB-228 551/8GA
06H PB-228 552/6GA
06H PB-228 553/4GA
06H PB-228 554/2GA
06H PB-228 555/9GA
06H PB-228 556/7GA
06H PB-228 557/5GA
06H PB-228 558/3GA
06L PB-228 560/9GA
13B PB-228 561/7GA
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06E PB-228 568-T/GA
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13B PB-228 649/0GA
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05K PB-228 651/6GA
12A PB-228 652/4GA
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06C PB-228 660/7GA
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